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IMPERIAL INSTITUTE
OF
AGRICULTURAL RESEARCH, PUSA.

PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

ZOOLOGICAL SOCIETY

OF LONDON

FOR THE YEAR

1871.

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PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

ZOOLOGICAL SOCIETY OF LONDON.

◆

January 3, 1871.

Professor Huxley, F.R.S., V.P., in the Chair.

Professor Flower exhibited and made remarks on a mounted skull of the common Sturgeon (*Acipenser sturio*), from the Museum of the Royal College of Surgeons. In this specimen, which had been prepared with great care by Mr. James Flower, the cartilaginous portions of the skull had been replaced by exact models of them made in wood, so that a much more complete idea could be gained of the whole structure than in ordinary examples.

Mr. Tegetmeier exhibited and made remarks on a specimen (in the flesh) of a female of the Great Bustard (*Otis tarda*), which had been killed on the 29th ult. near Feltham in Middlesex.

Mr. Gould exhibited and made remarks on a skin of Lady Rosse's Touraco (*Musophaga rossiæ*), just received in a collection of birds from Loanda. But one specimen of this rare bird was hitherto known to exist in scientific collections, namely that formerly living in Lady Rosse's possession, upon which Mr. Gould had founded the species in 1851 *.

Mr. A. R. Wallace, F.Z.S., read the following extracts from letters of Mr. John Wallace:—

"Stockton, California, May 1870.

"There is common on dry sandy plains a small animal known here as the 'Horned Toad,' but which is a Lizard (*Phrynosoma*, sp.?), having a broad body and short tail, covered all over with horny protuberances, and on the head five or six short and stout horns arranged like a crown. Under certain circumstances, apparently as a means of defence, this creature squirts out from one of its eyes a jet of bright-red liquid very much like blood. This I have observed three times from three different individuals, although I have caught many that did not do it. They do not generally use this defence when first captured, although I caught one a few days ago which squirted the liquid a distance of six inches over the back of my hand, and another ejected it when I flourished a bright knife before its eyes."

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* See P. Z. S. 1851, p. 93.

"October 1870.

"I have not got hold of a *Phrynosoma* lately, though they are common both in the mountains and the plains. It is only rarely that you can observe the squirting of the red liquid from the eye, as I have frequently tried to produce it and failed. I think it must come from the eye, as there appears to be no other place where it could come from." * * *

"With regard to Rattlesnakes, I have caught and killed dozens of them when I was in the mountains. When first seen or disturbed they are generally coiled up, with the tail erected in the centre of the coil, vibrating rapidly, so that it scarcely appears to move at all, the head slightly erected towards the point of danger. If not immediately attacked they will work themselves backwards, without altering the relative position of the head and tail, still rattling. The sound, as near as I can recollect, is more like the singing of a cricket in the fields than any thing else—perhaps not so high a pitch, and a little more tremulous."

Mr. A. R. Wallace stated that a lady who had resided in the southern states of North America had also compared the sound of the rattle when heard in the woods to the chirping of an insect; and if this was the case, and the animal made the noise when coiled up and *before being disturbed*, it would go far to explain the use of the rattle, which would be simply a decoy to insectivorous animals, to enable the sluggish serpent to capture them.

The Secretary read some extracts from some correspondence which had taken place between himself and Mr. G. W. des Vœux, Administrator of the Government of Santa Lucia, concerning the best method to be adopted for the destruction of the so-called "Rat-tailed" Serpent (*Trigonocephalus lanceolatus*), the well-known pest of that and the adjacent West-Indian islands. Mr. des Vœux had inquired whether it would be possible (or if possible, of advantage) to introduce the Mungoose (*Herpestes*), the Secretary-bird (*Secretarius reptilivorus*), or the Laughing Kingfisher (*Dacelo gigas*) into the island for this purpose. Mr. Sclater had replied that, under the circumstances mentioned by Mr. des Vœux, he thought that the Mungoose would be the most likely of the three to succeed, but that he feared that this animal would be more prone to destroy the domestic fowls of the inhabitants than the much-detested serpents, and had recommended that a sufficient reward should be offered for the destruction of these snakes, instead of any of the above-mentioned plans. At the same time, Mr. Sclater had forwarded to Mr. des Vœux a pair of the common Indian Mungoose (*Herpestes griseus*) from the Society's collection, in order that the experiment as to whether these animals would destroy the *Trigonocephalus* might be tried.

A recent communication from Mr. des Vœux, dated Government House, Santa Lucia, December 2nd, 1870, gave the following details of an encounter between one of these Mungooses and a snake of the above species.

"A 'Rat-tail' some twenty inches in length was produced in a glass jar, the mouth of which was secured with a piece of linen. The Mungoose was brought out and its cage opened; the jar was held out to it. As soon as it perceived the snake inside it became greatly excited, its fur presenting the appearance of that of a cat with 'its back up,' and its thick tail distended and bristling. It evinced intense eagerness to get at the snake by running round and round the jar, and tearing at the cloth over the opening with its teeth and claws. On the covering being removed the serpent sprung out upon the lawn, and advanced a few feet on the grass. The Mungoose at once attacked it, endeavouring to fix its teeth and claws in the back; but the snake seemed prepared for this style of attack, which he avoided by drawing his body suddenly back. Rapidly recovering himself, however, he darted at his active little enemy and apparently succeeded in touching it with his fangs, for the Mungoose with a sharp cry sprung suddenly about a foot from the ground, but alighting upon the back of the snake bit and tore at it savagely. A short struggle ensued, the position of the snake not allowing him to use his fangs; and upon the combatants separating, the snake crawled a few yards away, and his opponent began running in an apparently aimless manner about the lawn. This lasted some three or four minutes, during which time the snake crawled along with difficulty, seeming anxious to get away, and then remained quite still. Suddenly the Mungoose returned, seized the snake by the middle of the body and dragged him into its cage which was standing open. The Rat-tail did not give any signs of life after this operation. On gaining the cage the Mungoose proceeded leisurely to eat the serpent, commencing with the head, its sharp teeth crunching through bones and all. The cage was then closed, and every one retired with very little expectation of seeing the plucky little animal alive again.

"In about an hour's time the cage was reopened, and the hero of this battle coolly trotted out, showing no signs of being at all the worse for the fight.

"Upon examining the interior of the cage, which was quite clean, the only evidence which remained of the snake having been there was a small piece of his tail not quite two inches in length, which had doubtless been rejected as being less succulent than the remainder of his carcass.

"The Mungoose is at this moment just as brisk and lively as before the encounter, though a fortnight has now elapsed since it took place.

"It has defied all attempts to examine whether or not it was wounded, and if so to what extent.

"The serpent was not full-grown, but was of a size quite sufficient for its bite to have caused the death of a man in a few hours."

Mr. Sclater was well aware that similar experiments to this above recorded had been made more than once, and that similar results had followed, but had never heard any satisfactory explanation given of how it came to pass that the Mungoose was not injured, if it was really bitten by the Serpent.

A tenth letter on the Ornithology of Buenos Ayres, addressed to the Secretary by Mr. W. H. Hudson, C.M.Z.S., was read:—

"Buenos Ayres, August 21, 1870.

"Dear Sir,—People in Buenos Ayres are as familiar with the Gaviota (*Larus cirrhocephalus*) as with the domestic poultry about their houses. It is one of the trio of our commonest species, the other two being the *Teru* and the *Chimango*. But these two are exclusively land birds, and to make their acquaintance it is also necessary to go a few miles out of a great crowded city. Not so with the Gaviota, whose white graceful form is not more familiar to the gaucho dwelling far off on the inland plains, than to the sailors in every ship that navigates the river Plata, or to the townsman, who may know it well without ever having left the city's pavement.

"In October these birds congregate in vast numbers in their breeding-places, which are marshes covered with some aquatic plant, usually the loose growing *junco*. These reeds are much bent and broken down by the Gulls, and are used as material for their nests, which are placed on the water close together. The female lays four oblong eggs, large for the bird, obtusely pointed, of a pale clay-colour, thickly spotted at the large end with dull black.

"Every morning, at break of day, the Gulls rise up from their nests and hover over the marsh, uttering loud cries and producing a noise that may be heard distinctly two or three miles away. The eggs are excellent eating, resembling those of the Plover in delicacy of flavour, as well as in the lustrous pearl colour which the white assumes when boiled. From the circumstance of such large numbers of Gulls laying their eggs near together, it is a very easy task to get them; so that when the plains adjacent to their favourite spots become settled, they have but little chance of rearing their young, as the boys in the neighbourhood ride in and gather them every morning. The Gulls, however, are so tenacious of their breeding-places that they continue to resort to them every summer to lay, and only abandon them after several years persecution, or, as often happens, on the marsh drying up. But notwithstanding such quantities of their eggs are taken every year, the Gulls do not seem to diminish in numbers. The abundance of their food in the settled districts favours them greatly in their 'struggle for existence.'

"The young birds are of a pale grey colour mottled with dull brown, and have a whining querulous note. The plumage becomes gradually lighter through the autumn, winter, and spring; but it must be a year at least before they are perfectly like the adults in the fine ash-blue of the wings, and in the white bosom with its lovely perceptible blush. It is now ten months since the young were fledged, and yet, in a flock, an observer at a hundred yards distance can easily distinguish them from the old birds.

"So soon as the young birds are able to fly, the breeding-place is forsaken, the whole concourse leaving in a body, or scattering in all directions over the surrounding country; and until the following summer, the movements of the birds depend altogether on food and water. As I mentioned in my last letter, in seasons of drought they disappear totally, and when Grashoppers are very abundant appear in countless multitudes. Drought and Grasshoppers unfortunately often come together, so that the Gulls are not so useful as they would otherwise be. In dry summers, when the insects are abundant, it is common to hear people wish for rain, that the Gulls might come and devour the Locusts. Apparently Gulls have been useful to man in the same way on the western plains of North America*.

"The Gulls congregate in great numbers about ploughed grounds, filling the new-made furrow till it appears like a white line, hovering in a cloud over the ploughman's head, and following at his heels, fighting, screaming, buffeting, in a compact crowd. When feeding they invariably keep up a great noise and screaming. Wilson's expression in describing a northern species, that its cry 'is like the excessive laugh of a negro,' is also descriptive of the language of our bird. Its peculiar cry is lengthened and inflected a thousand ways, and interspersed with numerous short notes like excited exclamations. When their hunger is satisfied they fly to the nearest water, where they drink and bathe their feathers. Their ablutions over (in which they appear to take great delight), they retire to some open spot in the neighbourhood abounding in short green grass. Here they sit close together with their bills to the wind; in still weather they also all look one way; and the observer will watch the flock in vain to find one individual out of this beautiful order. It is remarkable that they do not stand up to take flight, but rise on the air directly from a sitting posture. Usually they flap their wings twice or thrice before the body is raised from the ground.

"In some seasons in August and September, after a period of rainy warm weather, the larvæ of our Great-horned Beetle rise to the surface, throwing up little mounds of earth as Moles do; often they are so numerous as to give the plains, where the grass is very closely cropped, the appearance of being covered with mud. These insects afford a rich harvest to the *Teru-teru* (*Vanellus cayennensis*), which in such plentiful seasons are to be seen all day diligently running about, probing and dislodging them from under the fresh hillocks. The Gulls, not having been endowed with a probing bill, avail themselves of their superior cunning and violence to rob the *Terus*. I have often watched their proceedings for hours with the greatest interest. Many hundred *Terus* are perhaps visible running busily about the plain on all sides; near each one a Gull is quietly standing regarding his intended dupe with the closest attention. The instant a great white larva is extracted, the Gull darts with such sudden fury to seize it, that the *Teru* is forced to take wing, and a violent chase ensues. The depredator follows close upon the Plover in all his turns, screaming all the time, until the *Teru*, frightened or tired out, drops the prize, and slopes towards the earth with a disappointed cry; instantly the pursuer's flight is checked, he hovers a moment, watching the worm fall, then straight and suddenly drops himself after it, swallows it with customary greediness, and hastens after the *Teru* to resume his watch.

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* "This I infer from a passage in Dixon's 'New America.' Speaking of the hardships the Mormons endured when first settling on Salt Lake, he tells us that the locusts eat down the grain as fast as it grew, but that this evil was finally overcome by their devices to trap the insects, and 'with the help of Gulls from the lake.'"

"Many Gulls constantly hover about the *Estancias* to feed on the garbage that is usually found in abundance about cattle-breeding establishments. When a cow is slaughtered they collect in great numbers, and quarrel with the domestic fowls over the offal. They are also faithful attendants at the shepherd's hut; and if a dead lamb remains in the fold when the flock goes to pasture, they regale on its carcass in company with the *Chimango*. Numbers of them are constantly seen soaring over the low shores of the river, and, when the tide goes out, quarrel on the sands over dead fish, stranded fry, or whatever animal refuse may have been left.

"The slaughter-grounds adjacent to the city are also haunted by hosts of these neat and beautiful scavengers. Here numbers may be seen hovering overhead, and mingling their excited cries with the bellowing of thousands of wild cattle and the shouts of men at their rough work—at intervals, wherever a little space is afforded, dropping themselves on to the ground reeking with clotted blood and entrails, greedily snatching up whatever morsels they can on the instant, and yet getting no speck or stain on their delicate dress of lily white and ethereal blue.

"It is only when their food is very abundant that the Gulls move in great bodies; at other times they are seen singly or in small parties; but at night they often congregate in myriads in some large pool, where they will sometimes keep up a great screaming until morning.

"Their curiosity or anger seems greatly excited by the appearance of a person on foot on the open plains; no sooner has the Gull spied him, than he sweeps toward him with a rapid flight, uttering loud indignant screams, that invariably attract all its fellows within hearing. These all pass and repass, hovering over the pedestrian's head, screaming all the time as if highly incensed, and finally retire, joining their voices in a sort of chorus, and waving their wings upward in a very singular fashion; but often, when they are almost out of sight, they suddenly wheel about and hurry back with fresh zeal to go through the whole annoying performance again. Their flight being so serene at such times, it is very easy to shoot them. Many persons, however, and particularly English residents, have a squeamish repugnance against eating their flesh. But the flavour of birds does not seem to depend altogether on their peculiar food; two species are sometimes equally good that feed very differently. The Burrowing Parrot (*Conurus patachonicus*) is very bitter in taste, and yet feeds on the same seeds as the Partridge and wild Pigeon; the Glossy Ibis eats the same food as the most delicious-flavoured Snipes, and yet, when cooked, its fat emits a sickening smell that renders it unfit for human food. Those who have eaten this Gull have found it rich and fine-flavoured, without any taint of rankness.

"The Gulls seem everywhere preeminent among the feathered race for the singular beauty of their flight. Our bird forms no exception, but all its aërial movements are characterized with the same grace and buoyancy that have been observed in the allied species in other continents. On a still, hot day they love to soar to a vast height, and at such times appear like diminutive white specks on the sky. In fair weather their flight is always placid, a large body of them seen at a distance appearing to travel with the serene motion of a cloud.

"When near, it is pleasing to see the wonderful precision with which each bird keeps its relative place in the flock. But it is in a high wind the Gull's flight is particularly interesting; casually observed it seems altogether wild and irregular. The bird toils onward, alternately turning the upper and under surface of its wings, now struck motionless in mid-air, and again sweeping onward with redoubled velocity, now dropping downward until it nears the surface, and soaring anon toward the sky, apparently without an effort of its own, but borne aloft by the resistless violence of the wind."

The Secretary read the following extracts from a letter addressed to him by Mr. Edward P. Ramsay, dated Dobroyde, Nov. 4th, 1870:—

"The *Ceratodus forsteri* is found in the upper waters of the Burnet, Burrum, and Mary rivers, also in the creeks running into them as well as in the head-waters of the Fitzroy and Dawson, and in the deep lagoons and water-holes in those neighbourhoods.

"On the Gutchey Run, about thirty miles from Maryborough, is a water-hole, near the residence of Mr. Hilsham, in which these fishes are very numerous, and might be taken at almost any time. In the winter, however (from June to September), they go into a sort of hybernation, and require to be stirred up preparatory to setting lines for them. In September they begin to be a trifle more lively; and, from accounts I have lately received from the Mary River, it seems they have all at once become very plentiful in the very water-holes where we had lines set for weeks before in August without getting a 'bite.' In fact they would not bite at all at that time, and the specimen I sent you was obtained in the Mary River, or rather in one of its upper branches. Now, however, they are caught almost daily. Their food consists of Mollusca (such as small specimens of *Cyclas, Anodon, Lymnæa,* and *Physa*), together with various water-weeds and grasses. It is highly probable that the natives' story of their coming out at night 'to graze' is quite correct, as I found in their intestines and stomachs *land grasses* which could only have been obtained by their coming at least partially out of the water. I am inclined to think that (like Eels) they may occasionally come out into the very shallow parts and edges of the water-holes, and even out on to the margins of the pools among the weeds and long grasses which hang over into the water.

"The stomach is curiously divided into compartments, each filled with food—grass, weeds, shells, &c. I am not sufficiently acquainted with the internal arrangements of animals to make any remarks upon this part of the subject; but I feel convinced that a close examination of the heart and lungs will prove that the *Ceratodus* is much more akin to the Batrachians than most of us are aware of.

"My brother John has gone up to our sugar-plantations on the Mary, and as the *Ceratodus* is obtainable within ten miles of our residence, I hope very soon to have living specimens down; it is his intention to keep them alive in a large tank, both *males and females*, and to watch their habits.

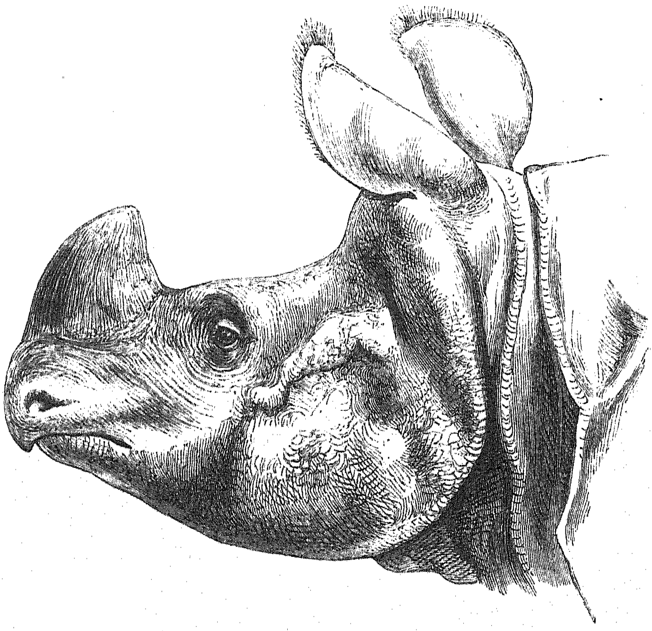
"Mr. S. B. Davis of Rockampton has been making great exertions to obtain me specimens from the Fitzroy, and has made several trips also to the Dawson; but unfortunately the distressing floods they have had there have prevented him obtaining any. The only fishes obtained were a few of the true Barramundi (*Osteoglossum leichardti*), which will be forwarded to me in due time. He informs me that the *Ceratodus* is plentiful in the water-holes, creeks, and lagoons in the western waters.

"I will forward you other specimens as soon as possible from various districts for comparison, and shall be glad to hear what your great ichthyologists think of them."

Mr. Sclater exhibited a horn of the male Indian Rhinoceros (*Rhinoceros unicornis*) living in the Society's Menagerie, which had been torn off by the animal on the 10th of August last—and made the following observations:—

"Our male and female Indian Rhinoceroses having been placed in the adjoining yards, in front of the new Elephant-house, on the 10th of August last the male made frequent attempts to raise the lower transverse bar of the strong iron railing that separates the two enclosures, by placing his horn under it. After repeating these attempts several times, in spite of the interference of the keepers, his efforts were such that the horn became suddenly detached under the violent pressure to which it was subjected, and rolled off into the yard. The animal appeared to be much hurt, and roared lustily for a few minutes. There was a considerable loss of blood from the wound, which, however, healed in a few days, neat's-foot oil being applied to it to keep off the flies.

Fig. 1.



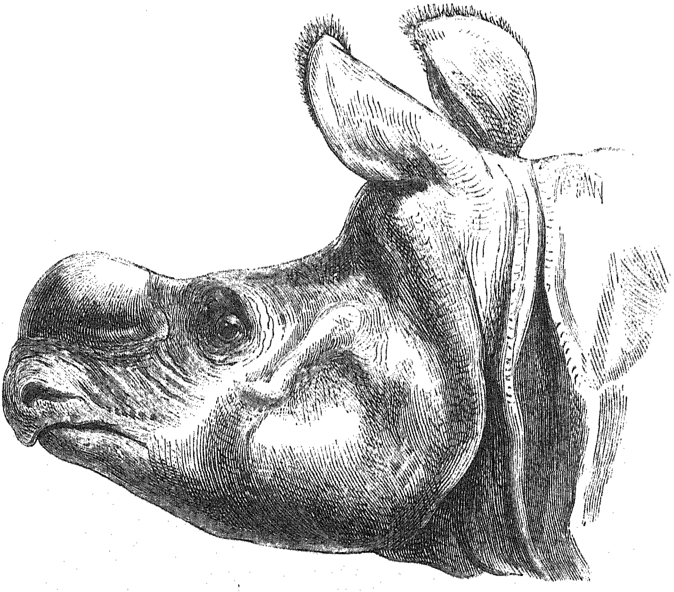
Head of male Rhinoceros before the horn was torn off (August 10th, 1870).

"The horn, as will be seen (fig. 1), measures about 12 inches in length along its anterior surface, which curves gradually backward; the widened base is 8¼ inches in long diameter, and 5½ inches across. The lower surface presents a considerable cavity, about 1¾ inch in depth, upon examining which it is clearly seen that the whole horn has been cleanly torn away from the matrix.

"Very soon after the loss of the old horn, we observed indications that a new horn was forming. This has increased rapidly in size, and is now already perhaps 1½ inch in height. It is thus certain that the Rhinoceros has the power of reproducing its horn, after the existing one has been broken off. I am well aware that this fact has already been noticed by different explorers and observers;

moreover Mr. Blyth has informed us (see 'Field,' Aug. 20, 1870, p. 173) that several years ago an accident similar to what has been here recorded occurred to an animal of the same species in the Zoological Gardens at Moscow, and that in this case likewise the horn grew again. I have nevertheless thought that the present occurrence is well worthy of a place among the records of the Society. It is notorious that the reproduced horn of an animal is liable to be materially different in structure from the normal horn; and it is very possibly due to some such accident as above mentioned, that we have been favoured with the creation of certain new species of Rhinoceroses that have been based upon horns alone*.

Fig. 2.



Head of male Rhinoceros, with new horn growing (January 3rd, 1871).

"In further illustration of this subject, I beg leave to exhibit a drawing of the present state of the horn of our old female Rhinoceros, which has now been in the Gardens since 1850 (see fig. 3). Instead of rising nearly perpendicularly from the nose, as in the ordinary form of this species, the horn in this animal projects forward beyond the end of the nostrils, and has now attained a length of 18 inches or thereabouts. This may perhaps be due to the practice indulged in by this animal for several years of grinding down her horn against the bars of her cage; for it is only within the last few years that this appendage has grown into its present shape. But it is obvious that nearly similar circumstances might occur in a state of nature, and that the horn thus developed would suffice for the foundation of a new species equally well with those already referred to."

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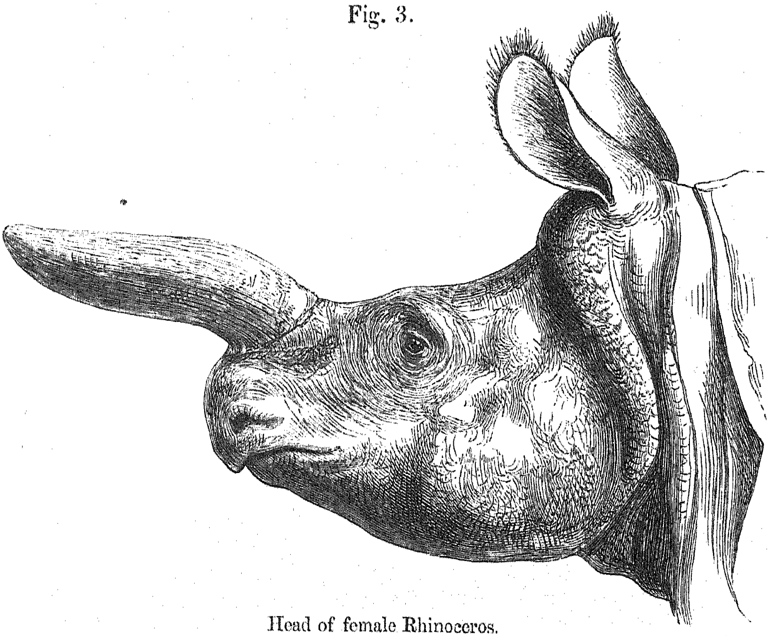
* *Rhinoceros crossii*, Gray, P. Z. S. 1854, p. 250, based upon an anterior horn of *R. sumatranus* (*cf.* Blyth, P. Z. S. 1852, p. 1), and *R. oswellii*, Gray, P. Z. S. 1853, p. 46, which is probably the same as *R. simus*.

Fig. 3.



Head of female Rhinoceros.

The following papers were read:—

1. Note regarding the Young Stage of the Sterlet (*Acipenser ruthenus*). By Andrew Murray, F.L.S.

[Received December 16, 1870.]

During the last summer I made an attempt to introduce the Sterlet from Russia into Britain by importing artificially impregnated ova, which was so far successful that I turned loose, in the Duke of Sutherland's river Fleet, from 150 to 200 lively young Sterlets which had come out on the voyage. I gave an account of my proceedings in two papers which appeared lately in 'The Field,' and to these I would refer any one who desires information regarding the practical part of the business. In the course of the experiment, however, two scientific observations were made which seem worthy of being placed upon record. The gentleman who was intrusted with the duty of procuring the ova, and who undertook a journey of 900 miles to the Wolga to get them, was Dr. Knoch, an experienced Russian pisciculturalist and able ichthyologist. I published his account of his journey in the papers I have above alluded to. In addition to the practical details and narrative there contained, he made the following observation regarding the micropyle of the ovum:—

"The assertion made by Professors Owsjanikow and Wagner and Mr. Kowalewsky, and contained in the Bulletin of the Academy of Sciences of St. Petersburg for June 29th, 1869, viz. that 'the micropyle-apparatus consists of seven micropyle openings grouped round a pole, of which one is situated in the centre, whilst the remaining six surround it in the form of a circle,' is not correct and is contrary to all previous experience. In direct opposition to the micropyle structure of these gentlemen, and in most perfect harmony with my observations on the eggs of other fish, was the proof which I had later an opportunity of giving, that in the eggs of the Sterlet, as well as in those of all other red fish (*Acipenserini*), the micropyle consists of a (towards the outside) *funnel-shaped, widened and simple canal*, and not by any means, as those *savants* assert, composed of several (seven) openings."

It is satisfactory to have this distinctly settled; for it certainly seemed a most unnecessary superfluity, whether of obstacles or openings, to have seven instead of one.

The other point is still more remarkable and unexpected. Dr. Knoch says, "Allow me to draw your attention to one very interesting circumstance which surprised us during the development of the Sterlet. Accustomed to the toothless jaw of the Sterlet and Sturgeon in a more advanced stage, we were not prepared to find teeth in the early stage of these fishes. We found, however, immediately behind the lips of the Sterlet just escaped from the egg, eighteen pretty strong and curved teeth; and when in their lively movements in the water they sometimes fall upon each other with their teeth, it is no easy matter to separate them."

Not being aware of this remarkable fact when I had the young Sterlets in my hands, I did not think of examining them in relation to it; nor did I observe any thing like them seizing each other; but my period of observation was necessarily very limited, my great anxiety being to shorten the period they were in my hands as much as possible, and get them safe into the keeping of nature in a flowing stream. I had, however, preserved two or three young specimens in spirits, and I have endeavoured to verify Dr. Knoch's observation upon these, but without success. My failure to do so, however, says nothing against the accuracy of his observation; for we all know how the tissues alter when preserved in spirits, and how much more difficult it is to make any delicate anatomical investigations upon specimens which have been so preserved.

Dr. Knoch adds that the barbles which characterize the *Acipenser* tribe are, in the young Sterlets, not fringed on the inside. I should say that, although this seems to be the rule, in one under pressure I saw what seemed to me something like two or three lateral barblets appearing on one side of a barble.

When the ova arrived many of them were covered by a forest of minute fungi. I submitted these to Mr. Berkeley, who informs me that "the matter on the fish-ova is a *Saprolegnia*; there being only one kind of fruit, and that scarcely perfect, I cannot tell the species. The curious point is, that it is accompanied by a mucor, probably a condition of the *Saprolegnia* (or the reverse), with quadrate spores, which I never saw before."

2. Descriptions of thirty-four new Species of Shells from Australia. By George French Angas, Corr. Mem. Z.S.L., F.L.S., F.R.G.S., &c.

[Received December 5, 1870.]

(Plate I.)

1. TRITON (CUMIA) SPECIOSA, n. sp. (Plate I. fig. 1.)

Shell ovately fusiform, moderately solid, with from twenty to twenty-two conspicuous, erect, rounded varices; whitish, sometimes with a narrow zone of pale chestnut on the lower portion of the last whorl; whorls 5½, encircled throughout with concentric ridges larger and smaller alternately, and decussated between the varices with sharp raised striæ, forming bead-like nodules at the intersection of the ridges; spire pointed; aperture ovate, white within; outer lip arcuate, thickened by a varix; columellar margin covered with a shining white callus; canal short, recurved.

Length 8 lines, breadth 4 lines.

Hab. Green Point, Watson's Bay, Port Jackson, at very low spring-tides (*Brazier*).

This elegantly sculptured shell appears to belong to a somewhat aberrant group of *Triton*, to which the subgeneric title of *Cumia* has been given, and of which the *Triton convolutus*, Brod., may be regarded as the type.

2. OLIVELLA EXQUISITA, n. sp. (Plate I. fig. 2.)

Shell ovately turreted, smooth, shining, pale brownish yellow, ornamented with three rows of irregular, rather distant, dark chestnut spots, one at the suture, the others near the centre and lower portion of the last whorl, and joined by fine pale chestnut undulating lines which are carried down to the base of the shell; whorls 5; sutures channelled; apex obtuse; outer lip a little thickened; columella slightly plicate anteriorly.

Length 4 lines, breadth 1½ line.

Hab. Coodgee Bay, New S. Wales, in shell-sand (*Brazier*).

A very handsome little shell, the waved lines on the whorls reminding one of *Voluta undulata*.

3. **Columbella (Mitrella) bicincta**, n. sp. (Plate I. fig. 3.)

Shell fusiform, smooth, somewhat thin, of a pale brown colour throughout, with two narrow opaque white bands, irregularly articulated with orange-chestnut spots, situated above and below the margin of the sutures, the second band being in the centre of the last whorl, and with very faint longitudinal zigzag markings here and there, more distinct toward the base; whorls 8; sutures impressed; spire acuminated, longer than the aperture; aperture elongately ovate, rather short; outer lip sharp at the edge, thickened externally, and somewhat coarsely denticulated within; inner lip shining, with a few slightly elevated nodules, the edge nearly straight and erect; channel slightly curved and somewhat produced, transversely striated externally.

Length 5 lines, breadth 2 lines.

Hab. Port Jackson, dredged near Watson's Bay.

4. **Columbella (Mitrella) attenuata**, n. sp. (Plate I. fig. 4.)

Shell acuminately fusiform, moderately solid, smooth, shining, brown, with a pale band below the sutures; whorls 8, very slightly convex, the last grooved at the base; spire attenuated, blunt at the apex, apical whorls darker; sutures impressed; aperture small, subovate; outer lip simple, arcuate, contracted at the base, variced behind, varix dark brown; columella nearly straight, callus slightly reflexed in front; canal short, a little recurved.

Length 4 lines, breadth 1 line.

Hab. Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

An elegant little species, distinguished by its very elongated form and its simple bands of light and dark brown.

5. **Hyalina (Volvarina) mustelina**, n. sp. (Plate I. fig. 5.)

Shell elongately ovate, light brown, with two grey bands bordered above and below with darker brown; spire short, apex obtuse; nucleolar whorls edged with dark brown; base rounded; aperture somewhat narrow; columellar lip a little arcuate below, with four equidistant plaits, the upper one nearly transverse, the others passing obliquely upwards; outer lip thickened, slightly inflexed, flatly variced behind, cream-coloured, the brown bands passing over the varix, finely dentate at the inner edge with about twenty teeth.

Length 2½ lines, breadth 1 line.

Hab. Dredged off the "Sow and Pigs," Port Jackson (*Brazier*).

6. **Marginella ochracea**, n. sp. (Plate I. fig. 6.)

Shell subtriangularly ovate, rather thin, smooth, shining, more or less of a pale straw-colour, and frequently with a faint orange effuse band next to the suture on the last whorl; whorls 4; spire obtusely conical, very blunt at the apex; aperture rather narrow; outer lip variced and thickened in the middle, the varix of a paler colour than the body-whorl; columella with four plaits, the posterior one a little obliquely descending.

Length 1½ line, breadth 1 line.

Hab. From shell-sand, coast of New South Wales.

7. Scala (Cirsotrema) morchi, n. sp. (Plate I. fig. 7.)

Shell acuminate, solid, whitish; whorls 9, rounded, decussated with longitudinal ribs and more numerous transverse ridges, the longitudinal ones evanescent at the base; sutures impressed; aperture nearly circular, entire.

Length 5 lines, breadth 1 line.

Hab. Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

8. Mathilda elegantula, n. sp. (Plate I. fig. 8.)

Shell elongately acuminated, thin, semitransparent, whitish; whorls 14, nearly flat, each ornamented with three rounded transverse ribs, the one below the suture the smallest, the interstices between the ribs finely longitudinally striate; striæ raised and very thin; base of last whorl smooth and flattened; nucleolar whorl sinistral; aperture subquadrate; outer lip thin, acute; columella straight, a little produced in front.

Length 5½ lines, breadth 1 line.

Hab. Dredged in Lane Cove Creek, Port Jackson (*Brazier*).

This exquisitely sculptured shell appears to belong to Semper's genus *Mathilda*, which he separates from *Eglesia* in consequence of the nucleolar whorl being sinistral. It, however, has much in common with the latter genus, the nucleolar whorl of its typical species not having, as far as I know, been yet observed.

9. Agatha australis, n. sp. (Plate I. fig. 9.)

Shell acuminately ovate, rather thin, opaque, whitish; whorls 8, slightly convex, suture a little canaliculated; spire acuminate, nucleus sinistral; aperture narrowly ovate; outer lip simple, thin; columella furnished with a strong spiral plait.

Length 4 lines, breadth 1½ line.

Hab. Port Jackson, N. S. Wales. Dredged near "Sow and Pigs" reef.

10. Odostomia simplex, n. sp. (Plate I. fig. 10.)

Shell acuminately ovate, rather solid, smooth, whitish; whorls 7½, rather flat, a little angulate at the sutures; spire acuminate; aperture subovate; outer lip simple, furnished within with elevated striæ; columella with a single sharp transverse plait.

Length 2 lines, breadth ¾ line.

Hab. Port Jackson, N. S. Wales. Dredged off "Sow and Pigs."

11. Syrnola tincta, n. sp. (Plate I. fig. 11.)

Shell subulate, rather solid, smooth, shining, whitish, irregularly banded and marked with brown; whorls 10½, nearly flat; sutures deeply impressed; aperture ovate; outer lip thin; columellar plait rather prominent.

Length 3 lines, breadth $\frac{1}{2}$ line.

Hab. Dredged off "Sow and Pigs," Port Jackson (*Brazier*).

12. CERITHIOPSIS CLATHRATA, n. sp. (Plate I. fig. 12.)

Shell elongately acuminated, moderately thin, of a pale yellowish colour; whorls 12, encircled by three nearly equally distant rounded ribs, and decussated all over with close-set longitudinal, somewhat undulating raised striæ; sutures deeply impressed; base of last whorl finely radiately striated; nucleolar whorl sinistral; aperture subquadrate; outer lip thin; columella arcuate, scarcely produced in front.

Length 3 lines, breadth $\frac{3}{4}$ line.

Hab. Dredged near "Sow and Pigs" reef, Port Jackson (*Brazier*).

13. CERITHIOPSIS CROCEA, n. sp. (Plate I. fig. 13.)

Shell elongately acuminated, rather thin, orange-coloured throughout; whorls 14, encircled by rounded, close-set ribs, four to a whorl, nearly equal in size; the interstices, which are very narrow, finely longitudinally striated; last whorl flattened and smooth at the base; nucleolar whorl sinistral; aperture subquadrate; outer lip thin; columella tortuous, strongly arched and produced in front.

Length 5 lines, breadth $1\frac{1}{4}$ line.

Hab. Dredged off Camp Cove, Port Jackson (*Brazier*).

A species of a beautiful orange colour, with four ribs on each whorl, and the intercostal spaces very narrow and finely striated.

14. LEIOSTRACA LESBIA, n. sp. (Plate I. fig. 14.)

Shell aculeate, rather thin, smooth, shining, whitish, obscurely somewhat opaquely banded next below the sutures; whorls 12, nearly flat, suture distinct; spire sharply acuminate; aperture elongately ovate, slightly effuse in front; outer lip acute, simple; columella callous and slightly twisted.

Length 6 lines, breadth 1 line.

Hab. Dredged at "Sow and Pigs," Port Jackson.

15. TEREBRA (HASTULA) BRAZIERI, n. sp. (Plate I. fig. 15.)

Shell elongately turreted, narrow, acute at the apex, shining, pale straw-colour, irregularly painted with brownish orange longitudinal flames, strongest and most numerous next the suture, and with an interrupted zone of suffused brown spots near the base of the last whorl, above which the painting ceases abruptly, leaving a pale band above the zone; nucleolar whorls tinged with purplish brown; whorls 13, flat, obsoletely distantly plicate, rather nodose next the sutures; aperture narrowly ovate; outer lip thin, with the margin slightly sinuous; columella tortuous; canal short, somewhat everted.

Length 1 inch 2 lines, breadth 3 lines.

Hab. Brisbane Water, New South Wales (*Brazier*).

16. Rissoina crassa, n. sp. (Plate I. fig. 16.)

Shell pyramidally ovate, thick, whitish, strongly distantly longitudinally plicate; whorls 7 to 8, slightly rounded, suture impressed, the last whorl with a rounded ridge at the base, over which the longitudinal plications are continued; aperture subovate, strongly and obliquely sinuate in front; outer lip sharp, thickly variced behind; inner lip thickened, sinuous.

Length 3½ lines, breadth 1 line.

Hab. From the "Bottle and Glass" rocks, under stones, Port Jackson (*Brazier*).

17. Clathurella hayesiana, n. sp. (Plate I. fig. 17.)

Shell ovately fusiform, rather solid, of a dull chalky-grey colour; whorls 7, angulated at the upper part, closely longitudinally ribbed and transversely ridged, forming flattened nodules at the points of intersection; spire sharp, apex purple; aperture elongately ovate, deep purple within; outer lip finely denticulated at the edge, contracted below; posterior sinus narrow and rather deep.

Length 6 lines, breadth 2½ lines.

Hab. Dredged in Lane Cove, Port Jackson, New S. Wales (*Brazier*).

This elegant species differs from *C. reticosa,* A. Ad. & Angas, in having the whorls angulate at the upper part, with the latticed sculpture less nodulous at the crossings; it also wants the band, the channel is more contracted and produced, and the nodose liræ are absent within the outer lip.

18. Clathurella tenuilirata, n. sp. (Plate I. fig. 18.)

Shell fusiformly turreted, solid, opaque, pale brown; whorls 8, convex, longitudinally ribbed with about eight somewhat compressed prominent ribs, crossed with distant narrow erect ridges that become sharply angular at the intersection, the entire spaces between them being very closely and regularly ornamented with fine hair-like concentric striæ; spire sharp; aperture narrowly ovate; outer lip thin at the edge, variced behind, the interior with a tubercle next the posterior sinus, which is broad and shallow.

Length 4 lines, breadth 1¼ line.

Hab. Goat Island, Port Jackson; dredged in 5 fathoms (*Brazier*).

19. Clathurella sculptilis, n. sp. (Plate I. fig. 19.)

Shell fusiformly turreted, moderately solid, pale brown; whorls 7, rounded, a little excavated next the sutures, longitudinally rather strongly costate, with about nine rounded ribs, between which are numerous fine erect longitudinal striæ, which become crescent-shaped on the flattened area below the sutures, and encircled with numerous concentric, somewhat irregular ridges, which are slightly nodulous at the intersections; aperture subpyriform; outer lip thin, sharp, variced externally, slightly sulcate within; columella straight; canal slightly produced and everted; posterior sinus rather deep.

Length 4 lines, breadth 1½ line.

Hab. Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

20. **Clathurella bicolor**, n. sp. (Plate I. fig. 20.)

Shell somewhat acuminately turreted, rather solid, pale ash-colour, with the base of the last whorl chocolate-brown; whorls 7½, rounded, somewhat angulate in the middle, longitudinally ribbed and concentrically narrowly ridged, slightly nodulous at the points of intersection; spire acuminate, with the apex sharp and of a brown colour; aperture small, ovate, stained above and below with brown interiorly; outer lip thin, denticulate within and strongly variced behind; posterior sinus broad and rather deep.

Length 3½ lines, breadth 1 line.

Hab. Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

21. **Clathurella brazieri**, n. sp. (Plate I. fig. 21.)

Shell elongately turreted, rather solid, pale brown, a little darker on the lower whorl and at the apex; whorls 7, angulated at the upper part, longitudinally plicate and transversely finely ridged; spire convexly acuminated; aperture elongately ovate; outer lip thin, simple within; columella arcuate; channel short, sharply recurved; posterior sinus wide, not very deep.

Length 3 lines, breadth ¾ line.

Hab. Dredged near the "Sow and Pigs" (*Brazier*).

22. **Clathurella albocincta**, n. sp. (Plate I. fig. 22.)

Shell ovately fusiform, moderately solid, whitish, the last whorl stained with brown, with a broad opaque white band in the centre; whorls 5, rounded, longitudinally ribbed with numerous regular nodulous ribs, and latticed with concentric ridges; aperture ovate; outer lip thickened, dentate within; posterior sinus narrow.

Length 2½ lines, breadth 1 line.

Hab. Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

23. **Clathurella bilineata**, n. sp. (Plate I. fig. 23.)

Shell ovately turreted, moderately solid, pale straw-colour or light brown, nearly white around the aperture and at the base, with a narrow brown band just below the suture, and a second between the periphery and the base of the last whorl; whorls 6, angulate at the upper part, coarsely longitudinally ribbed and transversely ridged, the interstices very finely decussately striated; aperture acuminately ovate; outer lip arcuate, contracted towards the base, and thickened behind; posterior sinus very shallow.

Length 2 lines, breadth ¾ line.

Hab. Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

24. **Fossarina brazieri**, n. sp. (Plate I. fig. 24.)

Shell depressedly turbinate, narrowly umbilicate, moderately solid, ashy grey, more or less blotched here and there with purplish brown; whorls 3½, irregularly spirally ridged (one at the periphery, and one near the suture being more prominent than the others) and transversely striated; sutures strongly impressed; spire slightly elevated, apex obtuse; aperture subcircular; outer lip simple; inner lip arcuate, thin; operculum multispiral.

Diam. maj. 1¾, min. 1, height 1 line.

Hab. Under stones, Shark Island, Port Jackson (*Brazier*).

25. Neritina (Vitta) pulcherrima, n. sp. (Plate I. fig. 25).

Shell small, ovate, smooth, shining, generally pale grey, more or less zoned with yellow, and with a white band near the upper part of the whorls, which is ornamented with patches of purplish-black waved lines, the whorl below the band being closely adorned with finer zigzag or undulating lines of the same colour; spire short, apex obtuse; whorls 3, rounded; aperture oblique, semilunar; outer lip thin; columella covered with a white, polished, spreading callus; margin slightly arcuate and crenate in the middle.

Length 2 lines, breadth 1 line.

Hab. Dredged near the "Sow and Pigs" reef, Port Jackson.

A very prettily painted little species of a more rounded form than *N. viridis*, Linn., and easily distinguished by its peculiar style of ornamentation.

26. Liotia speciosa, n. sp. (Plate I. fig. 26.)

Shell rather solid, depressedly orbicular, pale brown, encircled by three prominent ribs, and longitudinally finely distantly plicate, the interstices denticulate; whorls convex, excavated at the sutures; spire with the apex acute, exserted; umbilicus moderate, encircled by a rib similar to those on the body-whorl and decussated by concentric radiating striæ within; aperture circular; outer lip a little thickened; peritreme continuous.

Diam. 1 line, alt. ½ line.

Hab. Double Bay, Port Jackson. Under stones at a very low tide (*Brazier*).

27. Buccinulus niveus, n. sp. (Plate I. fig. 27.)

Shell elongately ovate, rather solid, white, shining; spire acuminate, pointed at the apex; whorls 7½, encircled by numerous unequal, irregular, impressed and finely punctured striæ, which become fewer towards the upper whorls; sutures impressed; outer lip thin, a little sinuous, arcuate; columella with a prominent bilobed fold near the lower part, and a single small one above; inner lip covered by a spreading callus.

Length 6 lines, breadth 2¼ lines.

Hab. Dredged near "Sow and Pigs" reef, Port Jackson (*Brazier*).

A species of an ivory-white throughout, in form not unlike *B. affinis* (*Solidula affinis*, A. Ad., Proc. Zool. Soc. 1854, p. 61).

28. Bulimus (Liparus) brazieri, n. sp. (Plate I. fig. 28.)

Shell oblong-ovate, thin, straw-colour, frequently with reddish-brown irregular spots and flames, and sometimes nearly all brown, longitudinally rugosely plicately ribbed and transversely striated, the intersections strongly granular; whorls 5, rather convex, sutures impressed; aperture ovate; outer lip thin; columella nearly straight, white, with a narrow dark brown band behind.

Length 8 lines, breadth 4 lines.

Hab. Sinclair's Range, King George's Sound.

This pretty species belongs to the same natural group as *B. angasiana*, Pf., *B. baconi*, Benson, and *B. mastersi*, Cox, all from the S.W. region of the Australian continent.

29. CORBULA VENUSTA, n. sp. (Plate I. fig. 29.)

Shell triangularly ovate, solid, rather ventricose, inequivalve, irregularly rugosely plicately concentrically striated, the striæ finer and more even towards the umboes, white, beneath a thin yellowish epidermis, with a short carnelion-coloured ray at the anterior side of the umbones; umbones tumid, approximating; umbonal ridge strong and angulate; anterior side rounded; posterior side narrowed and subtruncate.

Length 6 lines, alt. 4, lat. 3 lines.

Hab. Dredged on the "Sow and Pigs" bank, Port Jackson.

The only other species of the genus distinguished by the red umbonal ray is, as far as I am aware, *C. marmorata*, Hinds, which is a very much smaller shell, quite smooth, and comes from the west coast of Veragua.

30. NEÆRA (LEPTOMYA) PURA, n. sp. (Plate I. fig. 30.)

Shell thin, semitransparent, white, subovate, rather convex, equilateral, equivalve, ornamented with rather distant concentric raised lines; umbones tumid, rather prominent, approximating; anterior side rounded, posterior side obliquely truncate; ventral margin arcuate, slightly sinuate posteriorly; umbonal ridge distinctly angulate.

Length 6 lines, alt. 5, lat. 3 lines.

Hab. Lane Cove, Port Jackson, New S. Wales; in sandy mud (*Brazier*).

31. MACTRA (SPISULA) FLUVIATILIS, n. sp. (Plate I. fig. 31.)

Shell elongately ovate, rather compressedly convex, inequilateral, irregularly concentrically very finely ridged, covered with a rusty-brown epidermis; umbones small, submedian; anterior extremity rounded; posterior extremity somewhat produced and acuminately oval; ventral margin arcuate.

Length 6 lines, alt. 4, lat. 2¾ lines.

Hab. Dredged in brackish water, in 2 fathoms, Hawkesbury River, New S. Wales (*Brazier*).

32. CRASSATELLA FULVIDA, n. sp. (Plate I. fig. 32.)

Shell subtriangularly ovate, inequilateral, rather compressed, yellowish, faintly streaked and mottled with pale orange, concentrically strongly ribbed, the interstices rather wider than the ribs; umbones pointed, rather small, approximate, tinged with orange-red; dorsal margin laterally rather concave; ventral margin strongly arcuate;

posterior extremity ovate; anterior extremity rounded; internal margin simple, reddish purple within.

Length $3\frac{1}{2}$ lines, alt. 3, lat. $1\frac{3}{4}$ line.

Hab. Port Jackson; dredged near the "Sow and Pigs" (*Brazier*).

33. PERNA CONFUSA, n. sp. (Plate I. fig. 33.)

Shell transverse, concentrically finely striated, olive-brown, paler below the umbonal ridge; umbones tumid, approximate, and almost terminal, the umbonal ridge much raised and roundly angulate; dorsal margin straight, forming an angle with the posterior margin, which is arcuate above and rounded at the end; ventral margin slightly convex anteriorly, incurved behind.

Length 12 lines, alt. 6, lat. 5 lines.

Hab. Lane Cove River, Port Jackson.

Something like *P. fortunei*, but four times the size, more pinched and arcuate, and different in colour.

I adopt the original generic appellation of *Perna* as applied by Messrs. H. & A. Adams to this genus, which has priority over *Modiola* and *Volsella*. The *Perna* of Bruguières (1792) is *Isognomon* of Klein (1753).

34. LIMOPSIS BRAZIERI, n. sp. (Plate I. fig. 34.)

Shell depressedly subtriangularly ovate, subequilateral, whitish, concentrically finely ridged, and very faintly radiately striated, covered with a light brownish epidermis, which extends beyond the margin; umbones submedian, rather prominent.

Length $2\frac{1}{2}$ lines, alt. 2, lat. $1\frac{1}{2}$ line.

Hab. Dredged at the "Sow and Pigs," Port Jackson (*Brazier*).

N.B. I have placed the typical specimens of all the foregoing species in the British Museum.

3. On a Collection of Birds from Savai and Rarotonga Islands in the Pacific. By Dr. G. HARTLAUB, F.M.Z.S., and Dr. O. FINSCH, C.M.Z.S.

[Received January 2, 1871.]

(Plate II.)

The meritorious efforts of Mr. Johann Cesar Godeffroy, head of the well-known Hamburgian firm, to explore, in connexion with his mercantile undertakings, various parts of our globe to which his vessels resort, have been again successful as regards the avifauna of the Pacific. We have had the pleasure of receiving two small collections of birds: one from the island Savai or Savaihi, made by Mr. Kubary; the other from the small island Rarotonga, made by Mr. A. Garrett.

Savai, the largest of the islands of the Navigator group, in which

Dr. Gräffe collected several years ago for Mr. Godeffroy, has remained nearly unexplored. Only two of its birds are known—namely *Carpophaga pacifica* and the remarkable *Didunculus strigirostris*. Although this latter rare bird is wanting amongst the collections sent by Mr. Kubary, we have had the pleasure to find in them a quite new grallatorial form, our *Pareudiastes*, remarkable for the shortness of its wings, which remind one of those of *Habroptila*. The other species collected by Mr. Kubary are all identical with species from Upolu.

The small island Rarotonga, only eight geographical miles in circumference (?), situated in 21° 22′ S. lat. and 159° 54′ W. long., belongs to the Cook, or Hervey group, and has, as far as we know, never been explored by naturalists. Of the seven species of birds collected by Mr. Garrett in this island, three prove to be new, namely *Monarches dimidiatus*, *Aplonis cinerascens*, and *Ptilinopus rarotongensis*; the others are widely distributed well-known Pacific birds.

We regret that neither of these collectors, whom we have the pleasure of first introducing to public notice, give any notes concerning the habits, breeding, and other peculiarities of these birds. Such additions would have made our paper still more interesting and valuable.

Mr. Andrew Garrett is an American, who has been collecting already several years for the Smithsonian Institution and for the Cambridge Museum, U. S. A. For two years he has been employed for the Museum Godeffroy, and has explored the Paumotu archipelago and the Viti group. A large collection from the latter locality has been lost, unfortunately, by shipwreck.

Mr. Kubary is a Polish gentleman from Warsaw, who was a student of medicine, but was obliged to abandon his country, and was sent in April 1869 by Mr. Godeffroy to the Pacific.

Species from Savai.

1. Strix delicatula, Gould; Finsch et Hartl. Ornith. Centr. Polyn. p. 11.

One specimen (female), agreeing entirely with specimens from Upolu and the Vitis.

Long. al.	caud.	culm.	tars.	dig. med.	
9″ 6‴	4″ 0‴	9½‴	2″ 3‴	14‴	(Savai.)
10 0	4 3	10½	2 2½	15	(Savai.)

"Irides black; bill hornish grey. Native name, *O le lulu.*" (*Kubary.*)

From Savai we have already received this species in 1868, in a collection made by Dr. Gräffe.

2. Coriphilus fringillaceus (Gmel.); Finsch et Hartl. *l. c.* p. 25.

Nine specimens, amongst them males and females, which are alike in every respect, as already stated by Dr. Pickering. There is no difference between these and specimens from the neighbouring island Samoa, and from the Wallis Island Uëa.

Long. al.	caud.	rostr.	
3″ 11‴–4″ 2‴	2″ 4‴–2″ 6‴	5–5½‴	(♂)
4 1	2 4	5½	(♀)

"Irides orange-yellow; bill orange-red; feet orange-yellow. Native name, *Senga* or *Senga wao*." (*Kubary*.)

3. HALCYON RECURVIROSTRIS (Lafresn.); Finsch et Hartl. *l. c.* p. 41.

Three males and one female; both sexes alike and agreeing with specimens from Upolu, as described by us (*l. c.*). As usual in the members of the subgenus *Todiramphus*, there exists a considerable variation in the intensity of the colours of the underparts. In one male these are, as well as the neck-band, pale buff, as figured in the Atlas of the United States Exploring Expedition (pl. 17); in another male the neck-band and the sides of the body are dark buff, chin and middle of breast and vent nearly white; whereas in a third male the whole underparts, except the chin, are uniform intense buff, darkest on the vent and under tail-coverts; the spot on the occiput also varies from white to dark buff.

Long. al.	caud.	rostr.	latit. a bas.	
2″ 11‴–3″ 0‴	2″–2″ 3‴	13–14‴	6‴	(♂)
3 1	2 1	14	6	(♀)

"Native name, *Tistaro*." (*Kubary*.)

This species was hitherto known only from the Island of Upolu.

4. COLLOCALIA SPODIOPYGA (Peale); Finsch et Hartl. *l. c.* p. 48.

One specimen, similar to others from Upolu and the Vitis.

Long. al.	rectr. ext.	rectr. interm.	tars.
4″ 5‴	23‴	18½‴	4‴

5. RHIPIDURA NEBULOSA, Peale; Finsch et Hartl. *l. c.* p. 86.

One specimen in spirits, agreeing with the young bird from Upolu, as described by us, *l. c.*

Long. al.	rectr. med.	rectr. ext.	rostr. a front.	tars.
2″ 6‴	2″ 10‴	2″ 3‴	3¼‴	8‴

6. AMBLYNURA CYANOVIRENS (Peale).

Erythrura cyanovirens, Finsch et Hartl. *l. c.* p. 100.

Two specimens (in different plumages) of the young bird, but not different from Upolu specimens.

One specimen resembles the young, as described by us (*l. c.*); but the whole head is dark green, like the back; some of the feathers on the vertex show narrow edgings of a dull red; the tail-feathers and the upper tail-coverts are also dull red; the upper mandible is black, with a lateral yellow basal spot; the lower mandible is yellow, tipped with black; feet dark.

The other specimen, more advanced in age, has the vertex and cheeks already red as in the old bird, but the upper and under surfaces are still dark green, except a blue tinge on the chin and occiput; bill black, basal half of the lower mandible yellow; feet dark.

Long. al.	caud.	rostr.	alt. a bas.	tars.	dig. med.	
2″ 6‴	13‴	5‴	4½‴	8½‴	6‴	(jun., Savai.)
2 3	12	c. 5	4	8	5½	(jun., Savai.)
2 4	13	5¼	4½	8	6	(ad., Upolu.)

7. **Lobiospiza notabilis**, Hartl. et Finsch, P. Z. S. 1870, p. 817, pl. xlix.

We are much pleased to find a second specimen of this interesting new form in the collection of Mr. Kubary, from Savai. This specimen, forwarded in spirits, agrees with the type as described *l. c.*, but convinces us also that that, as we had suspected, was only a young bird. The specimen from Savai is apparently in a more advanced state, showing the whole surface of head, the upper tail-coverts, and the outer edges of the rectrices of a dirty pale reddish brown, which colour, having lost its intensity by the influence of the spirit, has been formerly of a vivid red. We are assured of this point by having before us an old specimen of *Amblynura cyanovirens*, in which the red of the head has also changed into a dirty reddish brown. We have reason to suspect that the very old bird of *Lobiospiza* will show a far more brilliant and beautiful plumage.

8. **Sturnoides atrifusca** (Peale); Finsch et Hartl. *l. c.* p. 107.

Three specimens, in every respect agreeing with specimens from Upolu. There exists some difference in size.

Long. al.	caud.	rostr.	tars.	dig. med.
5″ 4‴–5″ 8‴	3″ 9‴–4″	13‴	16–17‴	11½–12‴

"Native name, *Fuia*." (*Kubary.*)

9. **Carpophaga pacifica** (Gmel.); Finsch et Hartl. *l. c.* p. 142, et Journ. f. Orn. 1870, p. 134.

Three specimens, agreeing with specimens from Upolu and Tongatabu, and varying in the same way.

One, an old male, with a well-marked protuberance on the base of the bill, resembles a specimen from Upolu, except that the cheeks are also tinged with a delicate vinaceous hue.

Two other specimens, labelled "young males," without a knob, show the head and neck darker grey than in the adult bird. In one the grey of the underparts is tinged very faintly with vinaceous; in the other this colour already exists, but much less vivid than in the adult. The feet are dark brown in the young bird.

Long. al.	caud.	culm.	tars.	dig. med.	
9″ 2‴	5″ 8‴	10¾‴	14‴	15‴	(♂ ad., Savai.)
8 8	5 4	10	14	16	(♂ jun., Savai.)
8 4	5 5	10	14	16	(♂ jun., Savai.)
8 7	4 8	10	14	15	(jun., Rarotonga.)

"Bill black; iris black; feet red. Native name, *Fiaui*, or commonly *Lubé*." (*Kubary*.)

Some interesting notes on the habits of the *Lubé* in Tongatabu have been published by Dr. Gräffe (Journ. f. Orn. 1870, p. 408).

10. Rallus pectoralis, Less.; Finsch et Hartl. *l. c.* p. 156.

Four specimens, perfectly identical with others from Upolu, the Vitis, Tongatabu, and Australia.

In two specimens no sign of the cinnamomeous pectoral band is visible; two specimens show this band strongly indicated, although not yet fully developed. The small white spots on the feathers of the upper parts in three specimens form on the basal portion of the hind neck regular narrow cross lines, which in one specimen are still visible on the upper portion of the mantle.

Long. al.	caud.	culm.	tars.	dig. med.
5″–5″ 5‴	1″ 11‴–2″ 5‴	12–16‴	18–20‴	16–19‴

"Bill reddish grey; iris red. Native name *Vea*." (*Kubary*.)

That *Rallus forsteri*, Hartl., is identical with *R. pectoralis* we have proved already (P. Z. S. 1869, p. 548, and Journ. f. Orn. 1870, p. 136). We must also express our doubts concerning *Rallus hypoleucus*, nob. (*l. c.* p. 163), based upon the "Philippine Rail, var. B," Latham, which seems to be nothing more than an albinism of *R. pectoralis*, as suspected by Mr. G. R. Gray.

PAREUDIASTES*, gen. nov.

Char. gen.—*Rostrum ut in genere* Gallinula, *sed ptilosi ab oculis fere ad nares usque producta: scutello frontali parvo, postice rotundato. Alæ brevissimæ, obtusæ, truncatæ, remigibus* 3–6 *æquali longitudine. Cauda brevissima, lacera, decomposita. Pedes minores quam in* Gallinulis*; digitus medius tarso brevior, externus interno paullo longior; unguibus multo magis curvatis quam in genere* Gallinula.

11. Pareudiastes pacificus, sp. nov. (Plate II.)

Obscure plumbeo-ardesiaca; margine frontali et regione periophthalmica holosericeo-nigris, loris plumulis nigris rarius obsitis; occipite et dorso fusco-olivascente lavatis; glabella dilute flava; rostro dilute rubente; pedibus pallide rubris; alis valde truncato-abbreviatis; cauda vix conspicua.

Long. circa 10″, rost. a fr. 13‴, al. 4″ 2‴, tars. 16‴, dig. med. c. ung. 1″ 8‴.

Head, neck, and under surface dark slate-colour, on the flanks and anal regions changing into olivaceous black; under tail-coverts pure black; margin of the frontal shield, lores, and space round the eyes covered with short velvet-like feathers of a pure black; sides of head, chin, and upper portion of throat also black; occiput, hind neck, and mantle dark olive-brown; rump, upper tail-coverts, and the rudimentary soft tail-feathers olivaceous black; primaries and secondaries dark brownish black; coverts of the remiges and upper quill-coverts dark olive-brown, somewhat darker than the back; under surface of wing and under quill-coverts dark brownish black.

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* "*Pareudiastes*" (antiquorum) is a water-bird, which comes only in fine weather to land.

Bill reddish orange; frontal shield more yellow; legs and feet reddish; claws hornish brown.

"Bill light red, with a yellow frontal shield; legs and feet light red; irides brown-red. Native name *Punæ*." (*Kubary*.)

Long. tota.	alæ.	caud.	rostr. incl. scut.	rostr. a rict.	tars.	tib.	dig. med.	Latit. scut.
c. 10½″	4″ 4‴	16‴	16‴	14½‴	18‴	6‴	16‴	5‴

The single specimen described above, although marked by the collector, Mr. Kubary, as "young female," is apparently a full-grown bird, and exhibits such great differences from the nearest allied genus *Gallinula* that we cannot avoid separating it as a well marked distinct genus. In its general appearance it much resembles *Gallinula*, but may be at once distinguished by the shortness of its wings, the shortness of its toes, and its nearly rudimentary tail. The bill agrees with that of *Gallinula*; but the frontal shield is not so far extended (as in *G. chloropus*), and, what is of some importance, the singular short velvet-like feathers of the lores advance towards the base of the nostrils into an acute angle, whereas in *Gallinula* they never reach the nostrils. The wings, as mentioned already, are very short, rounded; their feathers very soft, broad, at the end rounded; the third to the sixth quills equal and longest; the second and seventh somewhat shorter; the first one inch shorter than the fourth; the longest secondaries nearly reach the primaries; therefore scarcely any prominent wing-end exists. As regards this singular structure of the wings, *Pareudiastes* seems to be most nearly allied to *Habroptila*, but is quite different from *Gallinula*. The same is the case as regards the tail, which consists of narrow lax feathers, nearly rudimentary. Not less than the wings are the feet different. In *Gallinula* the middle toe is always longer then the tarsus, whereas in *Pareudiastes* the middle toe is considerably shorter; besides, the nails are also shorter and rather more curved than in *Gallinula*.

The eyes seem to be uncommonly large; and this, as well as the other peculiarities, gives some right to suspect that this remarkable form will exhibit also interesting peculiarities in respect to its habits, of which, unfortunately, Mr. Kubary tells us nothing. We are strongly of opinion that *Pareudiastes* is unable to fly, and hope to get more information about it next time from the discoverer.

A second specimen of *Pareudiastes pacificus*, forwarded in spirits, is apparently younger. It shows the shield dirty yellowish; the bill reddish brown, the tip darker brown; feet and legs reddish horn-brown; claws horn-brown.

The measurements of this specimen are as follows:—

Long. tota.	alæ.	caud.	rostr. scut. incl.	rost. a rict.	tars.	tib. med.	dig. med.	Latit. scut.
10″	4″ 4‴	16‴	18‴	15‴	19‴	6½‴	16‴	4¼‴

The pollex is armed with a short, sharp spine (*spina pollicaris*). The oil-gland is present, with some short feathers at the end. The loral region is feathered sparingly with short velvet-like feathers. Eyes large.

12. PORPHYRIO VITIENSIS, Peale; Finsch et Hartl. *l. c.* p. 172; *id.* Journ. f. Orn. 1870, p. 135 (Tonga).

P. samoënsis, Peale.

P. indicus, Cass. (*nec* Horsf.), Unit. St. Expl. Exp. p. 308.

It was Mr. Cassin who first declared the *Porphyrio* of the Navigator group to be identical with the Javan *P. indicus*, Horsf. Not having had an opportunity of comparing specimens from the Navigators, we followed the views of Mr. Cassin without hesitation, although every naturalist who takes a special interest in geographical distribution would consider it as a very strange fact to meet with a Javan species so far east, and this so much the more as the neighbouring Viti group is inhabited by a different species, *P. vitiensis*. In 1868 we got two specimens of *Porphyrio* from Upolu, collected by Dr. Gräffe, and comparing them carefully with specimens from Viti and Java, we became convinced that the *Porphyrio* from the Navigators is by no means the same as the Javan *P. indicus*, but in every respect like *P. vitiensis*, a species which we have since received also from the Tonga group. The collection of Mr. Kubary contains a single specimen from Savai, which agrees very well with a specimen from Upolu, except that the back is darker, more blackish olive-brown, a difference already mentioned by us after examining a specimen from Ovalou (*l. c.* p. 280).

We have no doubt that *P. vitiensis*, Cassin, was founded upon immature birds; for the differences pointed out by Mr. Cassin are chiefly based upon the "much smaller size," a character which is not constant, as remarked already in our book on the Central-Polynesian birds, where also the differences between *P. vitiensis* and *P. indicus* are carefully explained (p. 174). *P. vitiensis*, therefore, undoubtedly is the only species occurring in the Central Polynesian Islands, and *P. indicus* must be struck out of its avifauna. Its size, as usually in *Porphyrio*, varies a good deal.

Long. al.	caud.	rost. incl. scut.	tars.	tib.	dig. med.	
8″ 0‴	2″ 10‴	2″ 4‴	2″ 11‴	17″	2″ 10‴	(Savai.)
8 1	—	2 6	3 0	15	2 7	(Upolu.)
8 0–8 10	3 4	2 1–2 4	2 9–3 1	18	2 8–2 10	(Tonga.)

13. ACTITIS INCANUS (Gml.); Finsch & Hartl. *l. c.* p. 184.

Two specimens in winter dress of this widely distributed species.

Long. al.	caud.	rostr.	tars.	dig. med.	
6″ 3‴	2″ 9‴	18‴	15‴	12‴	(Savai.)
6 7	2 7	—	—	—	(Savai.)
5 10–6 4	—	16–17	—	—	(Savai, *Gräffe*.)
5 11	2 6	17	15	12	(Rarotonga.)

This species had already been sent from Savai in 1868 by Dr. Gräffe; amongst the examples were also specimens in summer dress.

Species from Rarotonga.

1. MONARCHES DIMIDIATUS, sp. nov.

♂. *Supra sordide cinerascens, nonnihil fusco-variegatus; remigibus fuscis, rectricibus nigricanti-fuscis; subtus albus, loris interrupte fusco-nigricantibus; subalaribus et subcaudalibus albo fuscoque variis; pedibus plumbeis; rostro plumbeo-cærulescente, apice et tomiis pallidis.*

♀. *Supra dilute fulvo-rufescens, subtus fulvo-albicans*; *uropygio nigricante vario, plumis omnibus basi nigricantibus; rectricibus pallide rufescentibus, parte apicali latius nigricante, rufescente limbata; tectricibus alarum late rufo-marginatis, remigibus nigricantibus, rufescente stricte limbatis; subalaribus dilute rufis, subcaudalibus pallide fulvis; colli lateribus et pectore lætius vulpinis; rostro et pedibus sic ut in mari tinctis.*

Long. circa 5″ 7‴, rostr. 5½‴, al. 3″ 2‴, caud. 2″ 5‴, tars. 8½‴.

Male. All the upper parts, cheeks and sides of the neck included, dark grey; rump and upper tail-coverts darker, blackish grey; an indistinct pale greyish line on the lores, continued more indistinctly behind the eye; all the underparts white, washed along the sides with grey; thighs and under tail-coverts blackish, tipped with white; under wing-coverts dark grey, margined with white; remiges dark brown, at the basal portion of the inner web margined with white; quill-coverts also dark brown; tail-feathers uniform blackish, darker at the quills; shafts of the mantle-feathers whitish; shafts of the remiges and rectrices black, pale from beneath.

Bill dark plumbeous-blue, at the tips and along the edges of the mandibles margined with bluish white; feet dark plumbeous.

"Irides dark brown; bill, legs, and feet lead-colour." (*Garrett.*)

Another male has the upper parts darker, more slate-coloured, especially on the rump and upper tail-coverts, whereas a third male specimen shows the upper parts lighter, more decidedly grey than in the first described specimen; in this the underparts are also of a purer white, including the under tail-coverts, which are only at the base dark grey.

Female. All the upper parts, sides of the neck, and head vivid rufescent fulvous, the feathers on the mantle and rump dark brown at the base; the rump, therefore, is variegated more or less with dark brown; all the underparts fulvous, but considerably lighter than the back, and at the middle of the vent nearly white; remiges dark brown, margined on the inner web with white; the primaries on the outer web with a broad pale fulvous margin, broader and paler towards the base, the secondaries with a narrow rufous margin along the outer web; coverts of the primaries and secondaries dark brown, margined and tipped with rufous; smaller wing-coverts fulvous like the back; tail-feathers fulvous, much paler on the inner web, on the apical third dark brown, this colour much paler on the external feathers, which are margined with pale fulvous white; shafts of the remiges and rectrices dark.

Bill hornish black; feet dark plumbeous.

Another female shows the underparts much lighter, and the chin variegated with some pure white feathers.

A third female is lighter above and beneath; the underparts are whitish fulvous, the same as the tail-feathers; the remiges and their coverts appear nearly uniform dark brown, having the fulvous outer margins very narrow and indistinct. Bill black, base of mandible yellow.

Long. tota.	alæ.	rectr. int.	rectr. ext.	rostr.	tars.	dig. med.	
c. 5¾″	2″ 11‴–3″ 2‴	2″ 4‴–2″ 5‴	2″–2″ 1‴	5½–6‴	9–9½‴	6‴	(♂, 3 spec.)
—	2 10 –3 1	2 3 –2 5	2 0	6	9½	6–6½	(♀, 3 spec.)

This unquestionably new species is typical. The totally different coloured female, as is usual in the members of this genus, resembles very much the female of *Monarches niger* (*Muscicapa lutea*, Gml.), but may be distinguished at once by its much smaller size.

Of the habits of this bird no notice is given by Mr. Garrett, who discovered it. The species is represented by *M. niger* in the Societies and Marquesas archipelagos.

2. APLONIS CINERASCENS, sp. nov.

Fusco-cinerascens; pileo pure fusco, loris holosericeo-fuscis: subtus distinctius grisescens; uropygii plumis et supracaudalibus fuscis, apice late cinerascentibus; remigibus et rectricibus fuscis; crisso et subcaudalibus sordide albidis; subalaribus pallide fusco-cinerascentibus; rostro et pedibus nigris.

Long. circa 7½″, rostr. a fr. 9‴, al. 4″ 6‴, caud. 2″ 6‴, tars. 13‴.

Adult. Grey-brown; underparts paler and more decided grey, having the feathers at the end margined with grey; the feathers on the rump and upper tail-coverts also with greyish margins, which on the upper tail-coverts are nearly whitish, but not so distinctly marked as on the underside; head decided brown, with a slight coppery glitter; vent and under tail-coverts dirty white; under wing-coverts pale greyish brown, with whitish margins; remiges dark brown, on the margin of the inner webs paler; the inner secondaries with a very narrow pale margin along the outer vane, forming an indistinct pale stripe; tail-feathers dark brown; shafts of the remiges and rectrices blackish, pale from beneath; feathers of the mantle with very narrow pale shafts, which also are visible on the feathers of the breast. Bill and feet hornish black.

"Irides dark slate; bill, legs, and feet light bluish slate." (*Garrett.*)

Four other specimens agree with the description above; in some the grey end-margins on the breast, rump, and upper tail-coverts are so indistinct as to be nearly wanting; and thus the whole bird appears to be of a more uniform brown.

Long. tota.	alæ.	caud.	rostr.	tars.	dig. med.	
c. 7½″	4″ 3‴–4″ 8‴	2″ 6‴–2″ 8‴	9–9½‴	13–14‴	9–9½‴	(5 specim.)

This typical *Aplonis* is so distinct in coloration and size that it can hardly be confounded with any other species. We need not, therefore, give any comparison.

3. PTILINOPUS RAROTONGENSIS, sp. nov.

Supra psittacino-viridis; pileo intense violascenti-roseo, stricte flavo circumdato, fronte pallide fuscescente; scapularibus et alarum tectricibus saturate viridibus, marginibus externis dilute flavis; remigibus nigris, late viridi marginatis; subalaribus cinereo et flavido variis; rectricibus duabus mediis viridibus, reliquis pogonio externo viridibus, interno griseo-nigricantibus, omnibus apice late canescente, flavido limbato; gula sordide albida, colli lateribus, pectore superiore colloque postico dilute cærulescenti-cinereis, hinc inde virescenti-flavido variis, pectore inferiore abdomineque flavis, lateribus cinerascente adumbratis; macula indefinita epigastrii media vinaceo-purpurea; subcaudalibus flavis; rostro et pedibus plumbeis, illo apice pallido; iride flava.

Long. circa 8¼″, rostr. a fr. 5½‴, al. 5″, caud. 3″ 2‴, tars. 11‴.

Adult. Front and vertex purplish violet red, surrounded by a narrow indistinct line of yellow; occiput, sides of head, neck, crop, and upper part of breast delicate grey, the feathers of the latter bifurcated and with a pale yellow cross band; chin and middle of throat white, washed with pale yellow; breast and remainder of underparts yellow, purer on the vent and under tail-coverts, paler on the anal region; the sides washed with pale greyish green, the same as the feathered tarsus; on the middle of the lower portion of the breast a large spot of dark purplish red; back and upper parts vivid grass-green; primaries and their coverts on the outer web and end brilliant dark green, with a very narrow but distinct white margin, the inner web black; secondaries also dark green, but with a somewhat broader yellow margin along the outer web; coverts of the secondaries dark green, narrowly margined externally and at the end with yellow; larger shoulder-coverts brilliant dark green, broadly margined at the end with grass-green; wing beneath ashy grey; under wing-coverts delicate grey like the neck; tail dark green with a broad greyish-white end; the feathers, except the two middle ones, are on the inner web dark grey, crossed above the white end by a blackish cross band; the white end is margined narrowly with pale yellow; tail beneath dark grey, at the end broadly white.

Bill plumbeous, tipped with pale horn-colour; feet reddish brown; nails dark.

"Irides yellow; bill brownish yellow; legs purple red." (*Garrett.*)

In the young bird the vertex and hind neck are green, like the back; front and forehead covered with a pale violet-purple patch; sides of head and neck grey washed with green, the crop and upper portion of breast with greenish yellow; the underparts are of a less brilliant yellow; the sides darker greyish-green; the red pectoral patch is indicated only by some dirty purplish feathers; the pale yellow margins at the ends of the coverts of the secondaries are broader and form a distinct cross line; the white end-portion of the tail-feathers is washed at the outer web and apex with green; bill and feet brown.

Long. tota.	alæ.	caud.	rostr. a front.	rostr. a rict.	tars.	dig. med.	ung.	
c. 8″	5″ 0‴	3″ 1‴	5¼‴	8½‴	11½‴	9‴	3‴	(ad.)
—	4 7	2 8	5	7½	11	9	—	(jun.)

In our work on the birds of Central Polynesia, we have already shown that the different groups of islands in the Pacific are inhabited by different spècies of the genus *Ptilinopus*, which, resembling each other at first sight very much, nevertheless exhibit constant characters to distinguish them with certainty, as pointed out in our monograph of the Polynesian species of *Ptilinopus*. Since this monograph was written, we have declared the *Ptilinopus* of the Pelew group (our *Pt. pelewensis*, P. Z. S. 1868, p. 7) to be a distinct species; and now we have again occasion to introduce a *Ptilinopus* from the Cook's islands as new. *Pt. rarotongensis* is most nearly allied to *Pt. chrysogaster*, Gray, from Huaheine (Society's Islands), but may be distinguished at once by the dark red pectoral patch, which in *Pt. chrysogaster* is wanting. Besides, this latter species has the forehead and vertex pale rose, and the secondaries and upper quill-coverts are shining blue-green, with broad yellow margins. *Pt. roseicapillus*, Less. (*Pt. purpureocinctus*, Gray), from the Mariannes, also resembles it in possessing a red patch on the middle of the breast, but is otherwise quite different, the whole upper surface of the head being red as well as a patch on the base of the lower mandible; lower breast green, remainder of underparts orange. With the other species (*Pt. fasciatus* from the Vitis and Navigators, *Pt. porphyraceus* from Tonga, &c), *Pt. rarotongensis* cannot be confounded. The green of its plumage shows none of the metallic or coppery lustre observed in most of the other species.

We may remark that Mr. G. R. Gray has already published a *Pt. chalcurus* (B. of the Tropical Isl. of the Pacific, 1859, p. 37), founded on a specimen in the British Museum, said to be from the Hervey or Cook's archipelago. So far as can be told from the very short diagnosis ("much resembling *Pt. coralensis*, Peale, but front and vertex shining greyish purplish"), this so-called species has nothing whatever to do with our *Pt. rarotongensis*.

4. CARPOPHAGA PACIFICA (Gml.).

A young bird, resembling the young males from Savai described above, but having the underparts, instead of vinaceous, of a faint dirty ochre-brownish tinge, darker on the vent, the under tail-coverts lighter chestnut, base of bill without knob.

5. ACTITIS INCANUS (Gml.).

One specimen in winter plumage.

6. ARDEA SACRA, Gml.; Finsch et Hartl. *l. c.* p. 201; *id.* Journ. f. Orn. 1870, p. 136 (Tonga).

One specimen in full dress with well-developed seasonal plumes, but quite white, having only a few slate-coloured feathers on the back.

Bill yellow with brown culmen; feet dark.

"Iris yellow; bill luteous with dusky shades; legs and feet greenish-yellow." (*Garrett.*)

Long. al.	caud.	rostr.	tars.	tib.	dig. med.
10″ 3‴	3″ 3‴	3″ 1‴	2″ 7‴	15‴	2″ 1‴

7. GYGIS ALBA, Sparrm.; Finsch et Hartl. *l. c.* p. 232; *id.* Journ. f. Orn. 1870, p. 140.

One specimen, adult.

"Irides deep blackish brown; basal half of bill light blue, the other half black; legs and feet bluish slate." (*Garrett.*)

Long. al.	rect. ext.	rect. med.	culmen.	tars.	dig. med.
9″ 5‴	4″ 6‴	3″ 10‴	18½‴	5½‴	10‴

4. On the Skeleton of the Australian Cassowary (*Casuarius australis*). By W. H. FLOWER, F.R.S., V.P.Z.S.

[Received January 3, 1871.]

The external characters by which this species is distinguished from the other members of the genus are described by Mr. Sclater (P. Z. S. 1868, p. 376), and are also well portrayed in the last number of the supplement to Mr. Gould's 'Birds of Australia.'

A skeleton of a very fine adult specimen, presented to the Museum of the Royal College of Surgeons by Mr. Sclater, having been obtained by Messrs. Scott near their station at the Valley of Lagoons in Northern Queensland, has supplied materials for the following comparison with that of *C. galeatus*. Of the latter species I have examined three individuals—two belonging to the Museum of the College of Surgeons, and one kindly lent me by Mr. E. Gerrard, jun., for the purpose of comparison. Unfortunately the sex of the bird was not recorded in either case.

From the table of dimensions given below, it will be seen that there is a considerable difference of size among the three specimens of *C. galeatus*, but that the largest individual of this species is considerably exceeded in every dimension by the specimen of *C. australis*, so that the fact that the latter species attains to a greater size than *C. galeatus*, as stated by Mr. Sclater, is confirmed*.

In the skull, the only important difference observable between the two species is in the shape of the supracranial crest, formed in both of very light cancellar or spongy bony tissue, with an external layer no thicker than fine paper, and which is covered, in the living bird, by the horny casque. It is not safe, however, to lay too much stress on slight differences in the shape of this appendage, as it varies not only with age, but also considerably in the three (all perfectly adult) examples of *C. galeatus* examined. All of these, however, agree in having the apex of the crest directed backwards, in its having a long and strongly convex anterior border, and a short, vertical or concave posterior border; while in *C. australis* the apex of the crest points rather forwards, and the borders are of nearly equal length, the anterior being almost vertical and slightly concave, and the posterior sloping forwards and upwards and being somewhat convex, as shown in the figure. The crest is also more elevated vertically and more compressed, especially in its upper part and towards the edges. The extent of the cranial surface from which the base of the crest springs is almost identical in both species; the bones involved appear to be the mesethmoid, the nasals,

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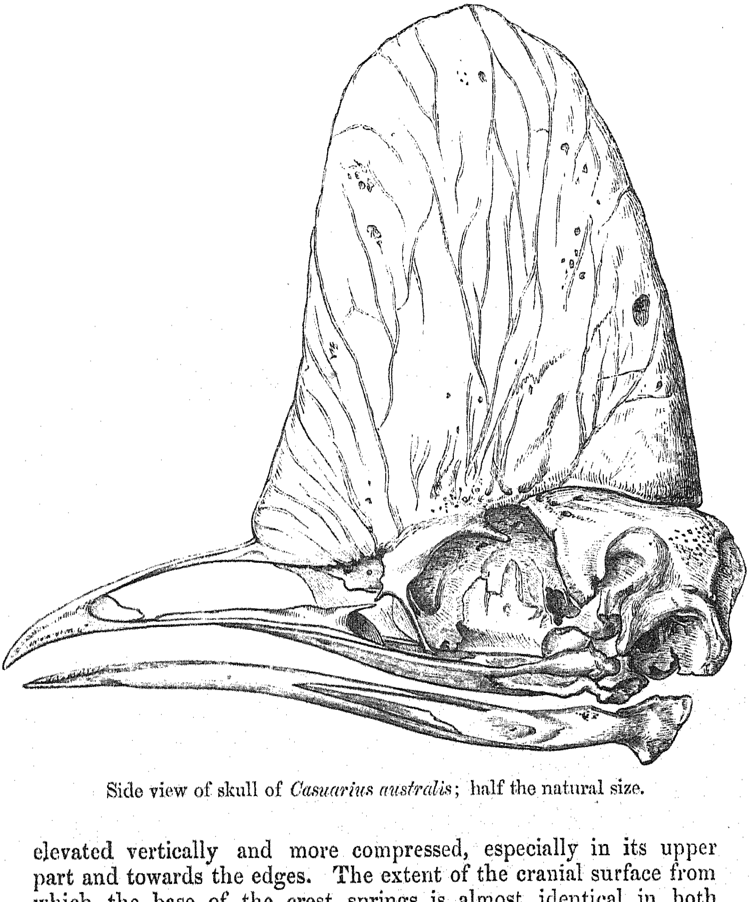
* The specimen described by Dr. F. Mueller (see P. Z. S. 1867, p. 241) is stated to have been of smaller size than *C. galeatus*.



Side view of skull of *Casuarius australis*; half the natural size.

the frontals, the lachrymals, and perhaps the parietals; but as all the cranial sutures are obliterated, the limits of the different bones cannot be exactly defined. In the specimen of *C. australis*, the base of the crest is produced backwards from its point of origin, so as to overlap part of the cranium, leaving a narrow fissure between (see fig., p. 33), whereas in one of the specimens of *C. galeatus* in the College Museum* the crest at the same spot rises vertically from the cranium. This appeared to be a good diagnostic character, until Mr. Gerrard's specimen was examined and found to agree with *C. australis* in the mode of origin of the hinder part of the crest, although in other respects it resembled the two College specimens of the species to which it was referred.

The anterior portion of the upper jaw, formed by the præmaxilla, is relatively longer, more curved, and more pointed in *C. australis* than in any of the specimens of *C. galeatus*; but some allowance must be made for the fact that the former was a wild bird, while the latter had all lived some time in captivity, and may not improbably have blunted or slightly malformed the extremity of the beak by repeatedly pecking the sides of the cages in which they were confined. No important distinction can be traced in the form or arrangement of the bones at the base of the cranium, except that the united palatine and pterygoid is somewhat broader in proportion to its length in the specimen of *C. australis* than in those of *C. galeatus*, though it is doubtful whether this is more than an individual peculiarity.

In the principal characters of the vertebral column and ribs all three skeletons of *C. galeatus* agree. They all have 25 free vertebræ in front of the sacrum. Of these, 15 are without moveable ribs, 4 have moveable ribs not connected with the sternum, 5 have moveable ribs connected below with sternal ribs, of which the first four are articulated directly to the sternum, while the fifth does not quite reach that bone, and one is a floating rib. A rib-bearing vertebra (the twenty-sixth from the skull) is ankylosed with the sacrum; but the rib it carries varies much in size and in characters, being nearly as long as the one in front of it, and quite free, in one specimen, and quite rudimentary and ankylosed to the vertebra in another. The sacrum is composed of about 20 ankylosed vertebræ (not counting the one which bears a true rib); and in the two specimens in which the tail is perfect there are nine caudal vertebræ, of which the last three are united together.

The skeleton of *C. australis* differs from these in several particulars. It has 26 free presacral vertebræ. Of these, 19 are anterior to the first one which is connected to the sternum, and hence may be called cervical, the same number as in *C. galeatus*; but the rib is ankylosed in the sixteenth instead of being free. There are five vertebræ bearing ribs with sternal ribs attached, all of which articulate directly with the sternum, instead of only the first four. Then there are two vertebræ bearing floating ribs anterior to the one which is ankylosed to the sacrum. This latter also bears distinct though small ribs, united on one side and free on the other, and clearly corresponds with the vertebra in the same position in the other species. The additional vertebra is therefore in the posterior dorsal, or lumbar region as it is sometimes considered.

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* In the other this part of the skull had been destroyed in taking out the brain.

The united sacral vertebræ do not appear to differ materially from those of the other species, though it is difficult to count the component elements; the caudal region, however, is shorter by two vertebræ, unless these have been lost in preparing the skeleton, though the good adaptation of the surfaces of the bones that are present gives no reason for supposing that such has been the case.

The sternum differs from that of the common species only in possessing five articular facets on each side for the sternal ribs, instead of four, and, of course, in its larger size. The pelvis and limb-bones appear to differ by this latter character only, as is shown by the subjoined Table of dimensions (all measurements taken in a straight line):—

		C. galeatus.		
	C. australis.	Mus. Coll. Surgeons, No. 1356 B.	Mus. Coll. Surgeons. No. 1356.	Mr. Gerrard's specimen.
	in.	in.	in.	in.
Length of skull from tip of præmaxilla to occiput	8·1	7·6	7·0	7·2
Length of base of crest	4·8	4·6	4·4	4·7
Length of beak in front of origin of crest	3·0	2·4	2·0	2·5
Vertical height of crest from upper margin of orbit	5·4	4·4	4·6	3·8
Greatest transverse diameter of crest	2·0	1·8	2·1	2·0
Greatest width of skull (at the quadrato-jugals)	3·1	2·8	2·9	
Length of pelvis	16·0	14·4	13·8	13·5
,, of sternum	10·0	8·4	8·0	8·2
Greatest breadth of sternum	6·8	5·7	5·6	5·3
Length of humerus	3·3	3·2	2·9	2·9
,, ulna	2·2	2·2	1·9	2·1
,, manus	1·5	1·5	1·3	1·2
,, femur	10·4	9·0	8·9	8·9
,, tibia	17·1	15·1	14·6	14·9
,, tarso-metatarsus	12·7	12·3	11·3	11·3
Breadth of lower end of ditto	2·5	2·3	2·3	2·2
Length of inner toe	4·8	4·3	4·3	4·2
,, of middle toe	6·4	6·2	5·8	5·5
,, of outer toe	4·3	4·1	4·1	3·8

January 17, 1871.

Professor Newton, F.R.S., V.P., in the Chair.

The Secretary read the following reports on the additions to the Society's Menagerie during the month of December 1870:—

The total number of registered additions to the Society's Menagerie during the month of December 1870 was 57, of which 1 was by birth, 12 were by presentation, 31 by purchase, 1 by exchange, and 12 were animals received on deposit. The total number of departures during the same period, by death and removals, was 89. Amongst the additions the most remarkable were:—

1. An example of the Amphiuma (*Amphiuma means*), purchased, Dec. 6th, of a dealer, and probably from one of the Southern States of North America. The Society have previously possessed two specimens of this animal, which were living in the Gardens from 1858 to 1861*.

2. A Praslin Parrakeet (*Coracopsis barklyi*, E. Newton, P. Z. S. 1867, p. 346, pl. xxii.), received in exchange Dec. 13th, being the second example of this rare Parrot acquired alive by the Society.

3. An example of Erxleben's Monkey (*Cercopithecus erxlebeni*, Dahlb. et Puch.), purchased Dec. 17th, and believed to be the first example of this rare and beautiful Monkey ever acquired by the Society. This species has been well figured by Dahlbaum in his 'Studia Zoologica' (plate v. fig. 12). The original describers were not acquainted with its exact locality. The present specimen, however, is certainly from some part of the West-African coast.

4. An example of the likewise rare Pluto Monkey (*Cercopithecus pluto*, Gray, P. Z. S. 1848, p. 56, Mamm. pl. iii.), purchased along with the last-named animal.

5. A small Tortoise of the genus *Podocnemis* from the Upper Amazons, purchased Dec. 16th, and certainly referable to *P. unifilis* of Troschel (Schomb. Guian. iii. p. 647). Mr. Edward Bartlett, who has met with this species in the same district, informs me that his specimens of it in the British Museum have been referred to the young of *P. dumeriliana*. This, I think, can hardly be correct. But I shall have some further remarks to make on this subject in some notes, which I have in preparation, on the Tortoises living in the Society's Gardens.

6. A Piping Guan (*Pipile cumanensis*)† purchased Dec. 20th, having been obtained by Mr. H. A. Wickham during his recent voyage down the river Cassiquiare. The bird was unfortunately in poor condition, and lived but a few days, but was of interest as being the only example of this species received alive by the Society for many years.

On concluding my series of reports upon the additions to the Society's Menagerie for the past year, I beg leave to take this opportunity of calling the attention of the Meeting to the register of accessions to the Menagerie now lying on the table. In it will be found the English and scientific name, sex, and locality, so far as these are ascertainable, of every vertebrated animal received alive by the Society, together with information as to how it was obtained, whether by presentation, purchase, or otherwise. A corresponding register is kept of all the deaths that occur in the Society's Gardens, and of the mode in which the bodies are disposed of. This lies also on the table. Both these registers, which are kept at the Superintendent's office in the Gardens, are, I need hardly say, at all times open to the inspection of the Fellows of the Society, or of any other person interested in them. Moreover, in order to give greater publicity to the list of arrivals, a copy of them is published every week in the 'Field' newspaper.

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* Two Amphiumas were purchased of Mr. Jamrach, Sept. 3, 1858. One died March 3, 1861, and the second May 1, 1861.

† Scl. et Salv. P. Z. S. 1870, p. 529.

From the earliest days of the Society's existence it has been the practice to keep a register of "arrivals and departures" in the daily journal of "occurrences," as it is termed, prepared by the Superintendent. Ever since the day when I had the honour of becoming Secretary of the Society, the register of accessions has always been carefully revised every month and an abstract of it printed in the 'Proceedings.' This was at first done month by month*; but it was thought afterwards to be more convenient to give the list of additions for the year continuously, so that since 1862 it has been printed entire as an "Appendix" to the yearly volume of 'Proceedings.' At the same time it has been my constant practice (as those here, who have so often had to listen to me, must be fully aware) to bring before the scientific meetings such notices as seemed to be requisite of all the more remarkable additions to the Society's collection, so as to call immediate attention to every accession of special interest. I have likewise edited and published four editions of the list of Vertebrated Animals in the Society's Gardens, and am now engaged in preparing a fifth edition, which will contain a register of every accession received up to the close of last year, and thus form a complete record of all the animals that have been living in the Society's Gardens during the past ten years.

I have been induced to trouble the meeting with these remarks, because in the last number of the 'Annals of Natural History'† a Fellow of the Society has assured the public that no proper record is kept of the living animals received in the Society's Gardens. How such a statement can have been made in the face of the facts above stated, I am not able to explain.

Mr. Howard Saunders exhibited a series of skins of birds of the genus *Aquila*, and made the following remarks on them:—

"Before commencing the exhibition of this formidable array of

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* See P. Z. S. 1859, p. 212, where the first of these lists (for May of that year) is given.

† Ann. Nat. Hist. ser. 3, vol. vii. p. 15.

Eagles, I wish to state that they have been examined by Mr. J. H. Gurney, Canon Tristram, Dr. Jerdon, and Mr. H. E. Dresser, and that their views on the subject coincide with my own, also that I have brought with me no specimens which do not immediately bear on the question. In addition to those lent by some of these gentlemen, I am indebted to Lord Lilford for the most important links in the chain of evidence which I have to bring forward.

"Although few Eagles exhibit more marked characters than the adult *Aquila imperialis* (of Cuvier, Gould, and Schlegel, = *A. mogilnik* of Gmelin and Latham), yet a great amount of confusion exists respecting it and some of its congeners in immature plumage.

"It will perhaps be best to begin by showing the different stages of the bird as observed in Europe.

"Thoroughly identified birds taken from the nest near Seville early in June 1869, by Lord Lilford, and still living in his aviary, were, when I saw them in a tawny plumage, certainly somewhat darker than Nos. 1 and 2, but still so light that several good ornithologists at the time pronounced them to be *A. nævioides*. Due allowance must be made for the burning sun of Spain on those before me; the result of which is clearly shown in No. 2, which is a bird hatched the same year as No. 1, but killed in February 1870 instead of October 1869.

"No. 3 is a still older bird.

"No. 4 shows the connecting-link of the tawny bird passing into the dark stage; the centre barred feather in the tail coming out above the uniform old feathers.

"No. 5. Leads up to

"No. 6. Adult female shot from her eggs.

"No. 7. I take to be a somewhat older male.

"So far as regards Spanish specimens, which as a rule exhibit a good deal of white on the carpal joints, and rather less on the scapulars than birds from the east of Europe and Asia Minor; this, however, varies not only with age, but with the time of year. I once possessed a Spanish Imperial Eagle with a great deal of white on one scapula and hardly any on the other. All the eastern specimens are adults; but Mr. Cullen, of Kustendje, writes word that all young Imperials there are tawny, and never *striated*.

"True *A. imperialis* at no time exhibits a striated plumage with white bars on the wings as in the Indian specimens now before us; yet these birds have been set down by many Indian naturalists as *A. imperialis*, and similar specimens in the British Museum from Nepaul are labelled *Aquila mogilnik*—the latter a hideous name; but the European bird has a prior claim to both. Mr. Allan Hume, in his 'Rough Notes of a Naturalist,' describes the stages we have here, but unfortunately omits the fourth, or adult stage, which I have not been able to obtain from India. I do not mean to say that *true A. imperialis* may not occur in India; nor do I say that this bird, when adult, may not have white scapulars; but I do contend that this bird is *not* true *A. imperialis*, but the *Aquila bifasciata*, as figured in Gray and Hardwicke's 'Ill. Ind. Zool.' vol. i. pl. 17. At pl. 28, vol. ii., the same species is again figured as *Aquila imperialis* ♀; and this has been the probable source of the error. So far *bifasciata* is a very good name for the Indian bird. The young bird of this species was obtained by Mr. Tristram near Lebanon, its most western known occurrence.

"I may remark that there is a great difference in the cry of these two species, that of *A. nævioides* being a yelp, whereas that of *A. imperialis* is a *hoarse* bark, not unlike that of the adult Great Black-backed Gull (*Larus marinus*).

"Major Irby first drew my attention to these Eagles; and an examination of Lord Lilford's birds, and of the sterna of many of these birds now on the table, confirmed the views which he suggested. For the loan of the sterna I have to thank Prof. Newton.

"Seeing that these two species run so close, it is impossible to say what many of the isabelline-coloured birds in Spanish museums may be; but at least we have *one* authentic specimen of *A. nævioides* here. I have hitherto no *knowledge* of its breeding in Spain, though I think it not improbable.

"Like some better ornithologists than myself, I at one time confused *A. nævioides* with *A. clanga*, a specimen of which I now exhibit to show how totally distinct they are, the affinities of the latter being with *A. nævia*, of which it appears to be little more than a larger race.

"The peculiarity in *A. nævioides* when adult is that the feathers are half of one colour, half of another; but in the young this is not so."

Mr. J. E. Harting, F.Z.S., exhibited and made remarks on a specimen of the so-called Sabine's Snipe (*Scolopax sabini*) in the flesh, recently killed. This bird was usually regarded as a melanoid variety of the Common Snipe (*Gallinago gallinula*); but Mr. Harting was not quite certain whether this view was correct.

Mr. Sclater exhibited a typical example of *Ateles variegatus*, Wagner (Säugeth. v. p. 78), collected on the Serra de Cocoi, on the Upper Rio Negro, by the late Johann Natterer, on the 9th of February 1831, which he had received in exchange from the Imperial Cabinet of Vienna, and pointed out its unquestionable identity with *A. bartletti* of Gray, as already stated by him (P. Z. S. 1871, p. 668, and Ann. Nat. Hist. ser. 3, vol. vi. p. 472).

Some extracts were read from a letter addressed to the Secretary by Dr. R. Brown, of Campster, F.R.G.S., concerning the best method of destroying poisonous Serpents, in reference to the discussion at the last Meeting upon this subject. Mr. Brown suggested the introduction of domestic Pigs into localities infested by Serpents, and stated that the plan had been successful in various parts of America where he had resided.

"For instance, no locality in the State of Oregon was more the haunt of the deadly Rattlesnake (*Crotalus lucifer*) than the valleys of Columbia River—a locality well known to all readers of the adventures of the early fur-traders on the Pacific slopes of the Rocky Mountains. Indeed, for some time after settlers came to that part of the country, so troublesome were the Snakes that they would even enter the houses and get under the beds. All efforts to lessen their numbers proved futile until Pigs became common in that part of the country. These Pigs were turned loose in the "oak-scrub" to feed on the acorns of the *Quercus garryana*, and generally to root about. From that day the reign of the Rattlesnake was on the wane; and now so few are they in this locality that though I stayed there for about a fortnight, continually roaming about the country on foot on botanical excursions, for a radius of six or seven miles, I do not remember even seeing one. It was not until I got beyond the range of the Pigs that they again began to be common. Between the Pigs and the Snakes there seems to be a natural antipathy. The moment a Pig sees a Snake it rushes upon it, grunting loudly; and before the Serpent can strike, it plants its foot on the Snake's head, crushing it, and then devours it. A Snake makes off immediately on the approach of a Pig; and so well do the Indians know of this antipathy, that I have often seen the women come to the settlers, begging for a piece of fresh Pig's skin to wrap around their ankles when gathering berries in the bush as a preventative against being bit by Rattlesnakes. This was in Southern Oregon, in Rogue-River valley; but the same belief (for which I doubt not there exists some good foundation in experience) is very widely spread. The Pig, it is said, is proof against the poison of the Rattlesnake. This I cannot certify as true, as I never had an opportunity of putting the assertion to the test. It may be, however, that the thick layer of fat in the Pig prevents the watery poison from reaching the more vital parts and so entering the larger blood-vessels."

M. Jules Verreaux, C.M.Z.S., made the following remarks on the colouring-matter of the wing-feathers of certain Touracoes, in reference to a discussion which had taken place at the previous Meeting:—

"Comme il a été question, dans la dernière séance de la Société, d'un fait assez intéressant sur le coloration des plumes de l'aile du genre *Corythaix*, permettez-moi que je viens vous soumettre quelques-unes des observations qu'il m'a été permises de faire durant mes longs voyages dans le sud de l'Afrique déjà en 1818, lorsque j'accompagnais au Cap de Bonne-Espérance feu mon oncle Delalande. J'observais dans le canton nommé Knysna un grand nombre du *Corythaix albocristata* de Strickland, et je remarquai que pendant les pluies diluviennes qui durèrent plusieurs jours, ces oiseaux qui habitent d'ordinaire la sommité des grands arbres, descendaient sur les branches basses, et cherchaient dans les lieux les plus touffus un refuge contre l'intensité de la pluie, mais je remarquais aussi qu'à ce moment leur plumage était tellement imbibé d'eau qu'ils ne pouvaient voler. Etant parvenu, après bien de la ruse, à m'emparer d'un sujet que j'avais saisi par l'aile, et qui m'échappa, quelle fut ma surprise de voir l'intérieur de ma main colorée en rouge comme du sang, mais qui disparut aussitôt le lavage. Ce fait m'ayant paru des plus curieux,

ainsi qu'à mon oncle, il fut convenu que nous chercherions à nous en procurer de nouveaux, ce qui eu lieu quelques jours après, la pluie n'ayant pas cessé pendant une huitaine de jours. Ainsi donc, nous étant livrés, ainsi que plusieurs de ses chasseurs à la recherche de ces oiseaux, nous ne tardâmes pas à nous convaincre que leur vol devenait impossible par l'imbibition des plumes et nous fûmes assez heureux pour en saisir trois exemplaires dans un état parfait de santé, sauf le tremblement causé par l'immersion, mais qui cessa dès que leurs plumes furent séchées. Nous renouvelâmes l'expérience que le hasard m'avait fourni, et pendant que les plumes étaient mouillées, nous n'eûmes aucune peine à les décolorer par le frottement, et à les rendre d'une rose pâle, surtout en les imbibant avec de l'eau de savon, car alors elles devenaient presque blanches. Mais ce qui nous surprit le plus, fut de voir cette même coloration rouge vif revenir dès que l'oiseau était complétement séché. Nous avons renouvelé cette opération deux fois par jour, et chaque fois nous avons eu le même résultat.

"L'expérience que j'ai faite moi-même sur d'autres espèces de la même famille, me prouve que toutes les plumes rouges sont pourvues d'une matière colorante qui s'efface en grande partie lorsque ces oiseaux sont exposés pendant longtemps à l'injure de l'eau, car sur le nombre que j'en ai pris ou tués, j'en ai remarqué un bon nombre dont la décoloration était presque complète, mais reparaissait toujours dès que l'oiseau était séché. Ce que je dis ici pour le genre *Corythaix* s'applique également au genre *Trogon*, qui comme les Touracos, possède un plumage dont la texture est tellement délié, que la pluie y produit le même effet. J'ai remarqué surtout sur l'espèce africaine, le *Hapaloderma narina*, que la belle coloration rouge du ventre était susceptible de décoloration pendant l'imbibition, et qu'alors ces plumes étaient roses, mais que, comme pour les Touracos, la vive coloration rouge reparaissait aussitôt que les plumes étaient sèches. Depuis mon retour en Europe, j'ai fait extraire des plumes de Touracos de diverses espèces la matière colorante, qui se détache, du reste, très-facilement dans de l'alcali, et qui au dire de plusieurs chimistes, pourrait servir avantageusement pour la toilette des femmes qui voudraient raviver leurs couleurs, et n'aurait pas l'inconvénient de rider la peau comme le font en général les matières minérales qu'elles emploient."

Mr. Sclater called the attention of the meeting to a letter from Prof. Baird, published in a recent number of 'Land and Water' (Dec. 31, 1870, p. 483), according to which and to Prof. Cope's note (Proc. Acad. Sc. Phil. 1868, p. 276) the so-called Axolotls, of which specimens were in the Society's Gardens, and about the development of which into Salamanders of the genus *Amblystoma* so much has been said and written*, would appear, after all, to be not the true *Siredon mexicanus* of the lake of Mexico, but the larvæ of *Amblystoma mavortium*, which had been named by Baird *Siredon lichenoides*.

This appeared to have been well known to the late Prof. Duméril,

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* *Cf.* Günther, P. Z. S. 1868, p. 319; and Tegetmeier, P. Z. S. 1870, p. 160.

who had correctly determined the species (*cf.* Nouv. Arch. d. Mus. ii. p. 265). But so long as the true Axolotl of the lake of Mexico (*Siredon mexicanus*) was never known to undergo any metamorphosis, it seemed to be too soon to arrive at one of the conclusions put forward by Prof. Duméril (*l. c.* p. 291) that the name *Siredon* must be altogether suppressed. No *Amblystoma* was known, according to Prof. Baird, to which *Siredon mexicanus* could possibly be referred.

The following papers were read:—

1. On the Skeleton of a Narwhal (*Monodon monoceros*) with two fully developed Tusks. By J. W. Clark, F.Z.S.

[Received January 17, 1871.]

In March 1869 I obtained for the Museum of Zoology and Comparative Anatomy at Cambridge, through the kindness of Professor Reinhardt of Copenhagen, a complete skeleton of an adult Narwhal, with both tusks fully developed. It had been brought to Copenhagen from Greenland a few weeks before by one of the officers of the Danish establishments there, and reached me in a very rough state, just as it had been hastily cleaned in the first instance. The skeleton is complete, with the exception of the pelvic bones, and measures from the central point of the tail-flukes to the ends of the maxillaries 14′, of which the skull occupies 22″. The greatest breadth of the skull across the squamosals is 16¾″. Of the tusks the right measures 6′ 1″ in length, and 8¾″ in girth at the outer edge of the socket; the left 6′ 7″, with a girth of 9½″. The tusks are 2¼″ apart at their origin, but diverge until they are 17½″ apart at their tips. The shorter tusk has evidently been accidentally broken, possibly after the capture of the animal; had it not been for this unfortunate circumstance, they would have been as nearly as possible of equal length. The sex was not stated; but there can be but little doubt that the skeleton is that of a male.

There are four excellent papers on the dentition of the Narwhal—by Mulder *, G. Vrolik †, Reinhardt ‡, and Jäger §. The first two being in Dutch, and the third in Danish, they are little known. I owe a translation of Reinhardt's to the kindness of Professor Flower; of Vrolik's I have had one made. I regret that I could not obtain one of Mulder's; but as it chiefly relates to the dentition of the young Narwhal, it less concerns my present purpose. Vrolik and Reinhardt both treat of bidental skulls; and so does Jäger to a certain extent.

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* Claas Mulder, "Over de tanden van den Narwal," &c. in Tijdschrift voor natuurlijke Geschiedenis, D. ii. 1835.

† G. Vrolik, "Nieuw Voorbeeld van twee uitgegroeide Stoottanden aan denzelfden Narval Schadel," in Bijdrage tot de Dierkunde, D. i. 1849.

‡ "Nogle Bemærkninger om Narhvalens Stödtand," Naturhist. Foren. Vidensk. Meddelelser for 1862.

§ Dr. G. Jäger, "Berichtigung einer Angabe Cuvier's," &c. in Jahreshefte des Vereins für vaterländische Naturkunde in Würtemberg: Stuttgart, 1851.

These authors have so thoroughly investigated the subject, that any value my paper may possess will be due to the fact of its introducing their views to English readers.

The skulls of the toothed Whales are generally asymmetrical, being twisted more or less, usually towards the left. This peculiarity is especially observable in *Monodon*. One would expect it to be greatly exaggerated in the skulls of the males, where the left tusk alone is developed, and the left maxillary is in consequence very large, and the right proportionately small. But it does not seem to be affected by the absence or presence of teeth. Female skulls, where neither tusk is developed, are equally twisted; and so are the bidental skulls (fig. 1, p. 46), so far as I have been able to observe them, with the exception of the one at Amsterdam, which, if Vrolik's figure is correct, is twisted far less than any of the others. The increased size of the right maxillary does not appear to affect the rest of the skull.

The normal dentition of the adult Narwhal is as follows:—In the male the left tusk alone is developed, while the right remains abortive in its alveolus. This closes over it so as to leave no external trace of the existence of a tooth within it. In the female both tusks remain abortive, like the right tusk in the male. The developed tusk measures usually, in an adult, about 98″ in length (of which 14″ are concealed within the alveolus), and is 8″ in girth at the outer edge of the maxillary. It is spirally striated in a direction from right to left; and frequently the body of the tooth is twisted upon itself in a spiral*, the direction of which is also sinistral. There are generally five or six turns of the spiral, which become gradually further and further apart as they approach the tip of the tooth, extending to within 6″ or 7″ of the point in a tusk of average length. The extremity is without spiral markings. Scoresby† notices that the striated portion is usually grey and dirty, the extremity clean and white; and of one taken in his Greenland voyage he remarks‡, "the tooth was covered, over the greater part of its surface, with a greasy substance, forming a blackish-brown incrustation. The underside of the horn, however, and a few inches of the point were quite clean, white, and polished." Anderson §, in a very graphic passage, compares the discoloured portion to the scabbard of a sword, so strong is the contrast between the grey and white portions.

I have carefully compared my bidental specimen with several normally developed Narwhal skulls in which the alveoli of the teeth have been laid open; and I find that the alveolus of the tooth or teeth is hollowed out in the maxillary alone, and in no other bone whatever. Hence Cuvier ‖ is wrong in saying that the alveolus is

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* Three such are preserved in the Museum of the Royal College of Surgeons, Nos. 2535, 2536, 2540; and in almost every museum, or shop where Narwhal ivory is sold, tusks so twisted may be seen. It may therefore almost be regarded as a normal form. For the dentition given above see Owen, 'Odontography,' p. 348.

† Arctic Regions, i. p. 490.

‡ Greenland, p. 133.

§ Nachrichten von Grönland, &c., p. 202.

‖ Oss. Fossiles, v. pt. i. p. 322.

"common to the maxillary and intermaxillary," or contained "in the intermaxillary only" *, a mistake which F. Cuvier has copied †. The wall of the alveolus is so thin on the underside in a full-grown animal that it chips off in maceration (fig. 2).

It has been asserted that the tusk of the Narwhal may be developed indifferently on the right side or on the left. This view was originally advanced by the two Cuviers and Lacépède ‡, and has since been brought forward again by Meckel § and Rapp ||, and more recently by Lilljeborg, who, in his paper on the Scandinavian Cetacea, says, "the long and sharp tusk, which is generally in the left side of the upper jaw, is spiral to the left. The spiral ridges run to the left, even when the tusk is in the right side of the upper jaw" ¶. In the Swedish original of the paper the passage runs as follows:—"The tusk, when on the right side of the upper jaw, has its spiral dextrorsal, instead of sinistrorsal" **. It was to controvert this statement that Reinhardt wrote his paper.

An examination of the ground of this assertion introduces us to the most fruitful of all sources of error in descriptions of the Narwhal, namely, erroneous figures. It is based on the woodcut given by Blasius ††, in which the right tusk is undoubtedly developed, with a dextrorsal spiral, and with the skull twisted towards the right instead of towards the left. But a careful examination shows, as Reinhardt points out, that Blasius has borrowed his Cetacean illustrations in general from G. Cuvier, from Brandt and Ratzeburg, and from F. Cuvier—and this one in particular, on a slightly reduced scale, from the last author, who has himself taken it from his brother's work, without observing that his engraver has reversed it in making the copy, the right side appearing as the left, and *vice versâ*. The same mistake has been made by Owen ‡‡, in borrowing Sir E. Home's figure; and by Pander and D'Alton §§. In figures of the entire animal the spiral is as often dextral as sinistral; but these are, one and all, so full of errors of every sort that we need not stop to consider them more particularly ||||.

It is true that the testimony of Fabricius may be advanced in

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* Ibid. p. 321. Comp. also 'Règne Animal,' ed. 1829, i. p. 292.

† Histoire des Cétacés, p. 230.

‡ Lacépède (Cétacés, p. 147), "Elle (la dent) est située au côté droit ou au côté gauche de la mâchoire supérieure." G. Cuvier (Oss. Foss. v. p. 321), "Dans le mâle il n'en sort ordinairement qu'une des deux (dents), le plus souvent celle du côté gauche." F. Cuvier (Cétacés, p. 237), "La défense . . . . qui se trouverait tantôt au côté droit, tantôt au côté gauche."

§ Meckel, 'Vergleichende Anatomie,' ed. 1829, iv. p. 516.

|| Rapp, 'Die Cetaceen,' p. 46.

¶ Lilljeborg, 'Scandinavian Cetacea,' ed. Ray Society, p. 244.

** Reinhardt, *l. c.*

†† Säugethiere Deutschlands, p. 525, fig. 282. Compare G. Cuvier, 'Ossemens Fossiles,' v. plate xxii.; Brandt and Ratzeburg, 'Medizinische Zoologie;' and F. Cuvier, 'Cétacés,' plate 17. fig. 3.

‡‡ Odontography, plate 87. fig. 1. Compare Sir E. Home, 'Lectures on Comparative Anatomy,' ii. pl. 42.

§§ Skelette der Cetaceen, p. 2, tab. v. fig. *a* and *b*.

|||| Compare, for instance, the figure in Trans. Roy. Soc. 1813, plate vii. fig. 2.

favour of this view; for he says, in his 'Fauna Grœnlandica*, "De maxilla superiore, latere alterutro, jam dextro, jam sinistro, prostat dens prælongus." That he should have made such a mistake is ingeniously accounted for by Reinhardt, who argues that, as Fabricius resided in the south of Greenland, at Narksalik in Frederikshaab district, whereas the Narwhal rarely appears south of the 65th parallel, it is highly probable that he never saw one alive, or even a skull, the tusk being the only part of the animal that was preserved in those days.

The statement of Fabricius is, so far as I know, utterly unsupported. I have never seen a Narwhal skull with a tusk on the right side, nor heard of a single well accredited instance of such a skull having been seen by others. One instance alone is mentioned in the whole literature of the subject; and that, though resting on the testimony of Pallas, must be received with caution. He states† that he saw at the British Museum in London a Narwhal skeleton, 12′ long, with a tusk, 4′ in length, on the right side of the skull. Pallas is generally so accurate, and in this particular case is so precise in giving the measurements of the specimen referred to, that one cannot help feeling sure that he is writing from notes and not from memory. Otherwise the length of time, nearly fifty years ‡, that intervened between his visit to London and the publication of the 'Zoographia,' coupled with the fact that the specimen cannot now be found, and that no record has been preserved of its existence, would suggest that a mistake had been made. As the case stands I confess that I feel disposed to accept Pallas's statement as accurate, and to regard the remarkable specimen he saw as a unique divergence from the rule. On the other hand, Scoresby § never saw a tusk on the right side of the head; and Reinhardt ‖, who in his position at Copenhagen has had singular opportunities of studying the Cetacea, says that during the past thirty years he has examined as many Narwhal skulls, and never found a tusk on the right side.

I may take this opportunity of correcting a statement of Owen's, which at first sight would seem to favour the existence of a tooth on the right side. In his description of a Narwhal skull in the Hunterian Collection, No. 2525, he remarks, "The left tusk is, in this instance, abortive," implying that the right is developed ¶. On reference to the skull, however, it appears that he has mistaken the right side for the left, as so many of his predecessors have done; for it is perfectly normal in all respects.

Although there is no evidence in support of the development of a

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* Ed. 1780, p. 30.

† "In alio sceleto, quod Museum Britannicum habet, duodecimpedali, dentem unicum quadripedalem in dextro alveolo, alterum alveolum plane oblitteratum vidi." (Zoographia Rosso-Asiatica, i. p. 296.)

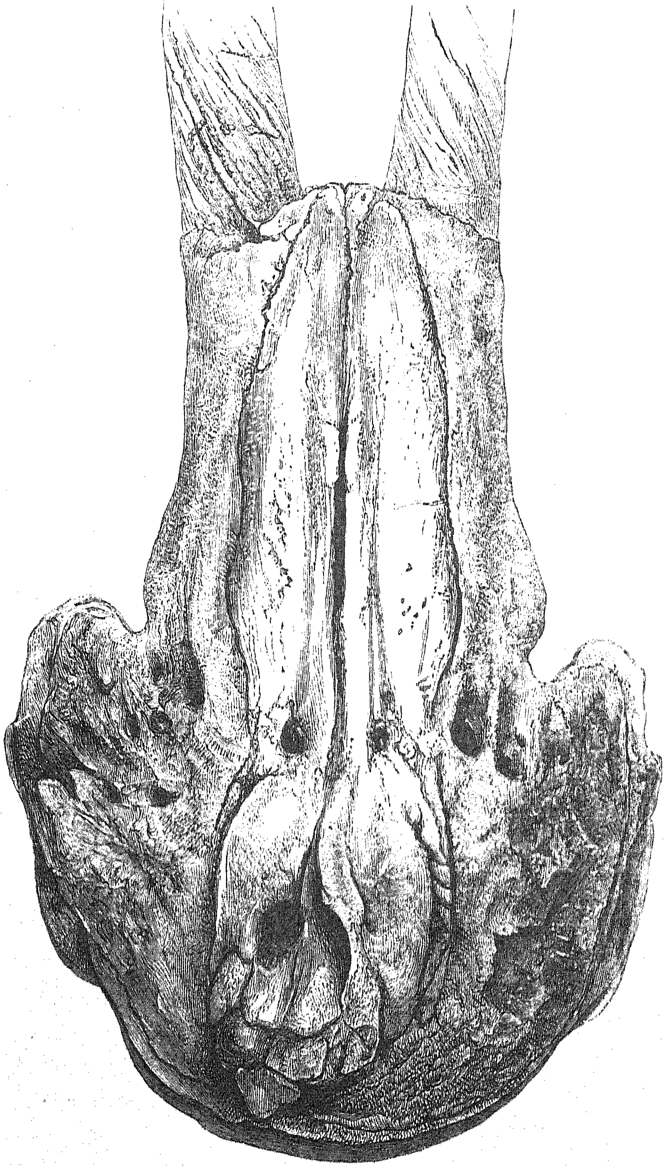
‡ Pallas visited London, according to Prof. Reinhardt, in 1761. The 'Zoographia' was published in 1811.

§ Arctic Regions, i. p. 490.

‖ Reinhardt, *l. c.*

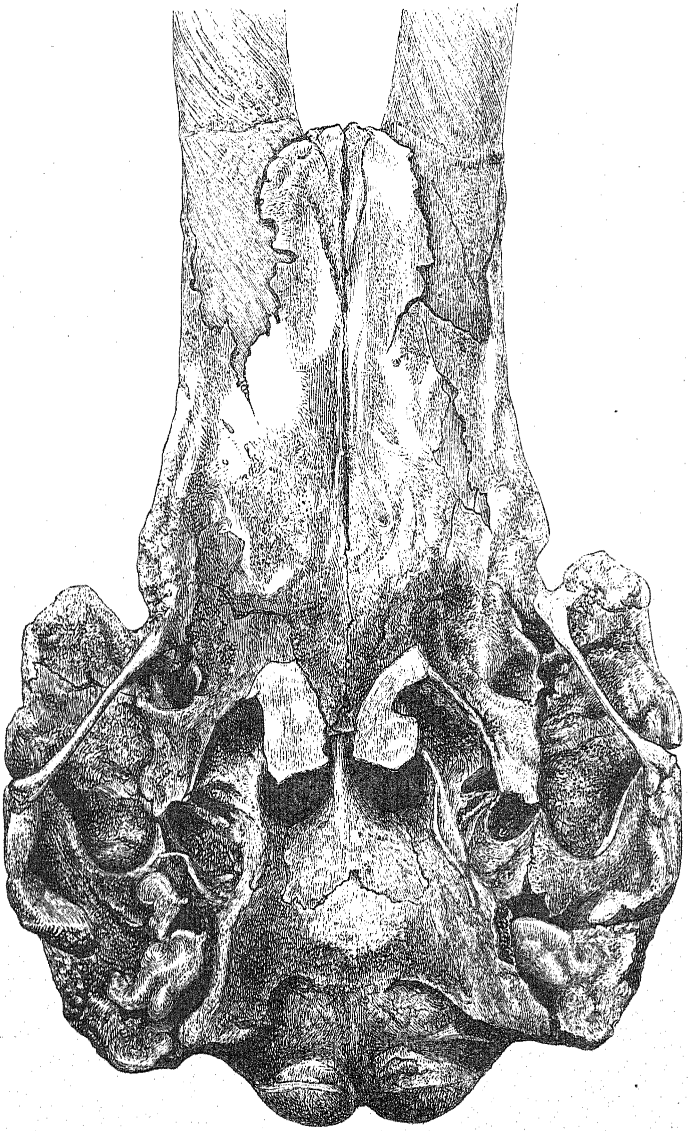
¶ Cat. Mus. Roy. Coll. Surg. (Osteology), ii. p. 185. The error was pointed out to me by Prof. Flower.

Fig. 1.



Superior surface of skull of *Monodon monoceros* with two tusks.

Fig. 2.



Inferior surface of skull of *Monodon monoceros* with two tusks.

tusk on the right side, yet there are passages in Scoresby* which point to other abnormalities in Narwhal skulls. He says, "All the male Narwhals that I have at different times seen killed, *excepting one*, had a tusk of 3′ to 6′ in length projecting from the left side of the head." Provokingly enough, he gives no further particulars. I should conjecture, by comparing this passage with what he says elsewhere, that he means that he once saw a male Narwhal with no tusks at all. Such a case would be paralleled by those of female Narwhals with developed tusks, three of which are on record. The first is mentioned by Anderson†, who says that the skull with two tusks brought to Hamburg in 1684 belonged to a female. The second is a very remarkable instance, and rests on the authority of Scoresby‡. On his Greenland voyage he captured "a female Narwhal, with a tusk 4′ 3″ in length, of which 12″ were imbedded in the skull," on the left side, and with a *dextrorsal* spiral. On the right side was the usual undeveloped tusk, 9″ in length. The third is to be found in the Transactions of the Linnean Society for 1821 §. "A Hull whaler took a ♀ Narwhal with a tooth in the upper jaw, perfect, and in every respect like those of the males, though not so large. The sex of this animal was satisfactorily ascertained in cutting up, when two fœtuses were taken out of it."

The undeveloped tusk of the right side is usually about 9″ long, smooth, tapering, and found to be solid when a section of it is made. At the extremity there are sometimes a few markings, in a spiral or a circular direction. In adult specimens the pulp-cavity has closed up, and its place is marked by a very shallow depression on the outer edge of the maxillary. At the base there is always a rough, irregular growth, almost like the "burr" on a stag's horn. In a specimen in the Cambridge Museum, obtained by exchange from Hull in 1865, and in which the undeveloped tooth has never been removed from its socket, this growth forms a knob turned to the left. Scoresby notices this peculiarity, and observes that it is a distinguishing mark of female skulls—a statement that would appear to require further investigation. The examination of these abortive tusks, without knowledge of the animal to which they belonged, led naturalists such as Lacépède to believe in the existence of a smaller species, to which he gave the name of *Narwhalus andersonianus*, just as *Narwhalus microcephalus* was made from the examination of a tooth that was not full-grown.

When Narwhal tusks first came into the market, they were considered to belong to a marine variety of the Unicorn of Scripture; and much has been written to show that they fulfil all the required conditions. They were sold for very high prices, deposited in royal and ecclesiastical treasuries, and believed to be a specific against poisons and fevers. Dr. Olaf Worm of Copenhagen (better known by his Latin name Wormius), was the first who had the opportunity of observing the tooth *in situ*. He recognized the animal to which it belonged as a Cetacean, and gives a tolerably accurate description and figure*.

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* Scoresby, 'Arctic Regions,' i. p. 491.

† Anderson, 'Nachrichten von Grönland.'

‡ Scoresby, 'Greenland,' p. 136.

§ Vol. xiii. p. 620. The statement is given on the authority of W. R. Whatton.

The existence of the second tooth was unsuspected till Solomon Reisel discovered it in a skull at Stuttgart. His paper "De unicornu marino duplici," dated Dec. 23, 1700, contains the first announcement of the fact, with a tolerable figure†. Cuvier, who appears to have known no more about the paper than its title, quotes‡ it as an authority for the existence of a bidental cranium in the Stuttgart Museum. This error is pointed out by Dr. G. Jäger in his paper. The next author who found out the fact was Tycho Tychonius at Copenhagen in 1706. His rare tract, "Monoceros piscis haud monoceros," is usually quoted as the place in which the fact is first stated§. Reisel considered that the second tooth was kept in reserve, as it were, to replace the fully-grown one in case it should be destroyed by an accident. Crantz knew that the second tooth existed, and held the same views as Reisel respecting it (Greenland, i. 105). Subsequently Sir E. Home went into the question once more, and published some good figures of male and female skulls with the tusks *in situ*, from specimens in the Hunterian collection‖.

The striation of the exserted tusk is always from right to left. I am not aware that this had ever been denied till Prof. Lilljeborg advanced his theory, though Lacépède speaks doubtfully on the subject (Cétacés, p. 146). Reinhardt remarks, "It seems to me that the spiral twisting of the tooth must evidently be considered as an effect of the same cause which produces the general asymmetry in the cranium of the Narwhal, as well as in those of all other Dolphins, the whole skull being twisted from the right towards the left side. That a tooth developed on the right side should be twisted to the left is, in my opinion, so far from being any thing unnatural, that it would, on the contrary, be quite incomprehensible if the tusk remained uninfluenced by that power which causes the whole skull to be twisted from right to left." He proceeds to argue that a proof of the correctness of this view is afforded by the bidental skulls, where the striation of the right tusk is the same as that of the left (figs. 1, 2). It is curious to remark that Owen's chief reason for rejecting a bidental skull in Brookes's Museum was the fact that the spiral lines on the right tusk corresponded with, instead of opposing, those on the left¶.

Reinhardt proceeds as follows:—"There is only one supposition that would make me feel inclined to believe that the tusk of a Narwhal could be twisted from the left to the right. We know that there exist species of Flounders of which single individuals, contrary to the general rule, have their eyes on the left side of the head instead of on the right, or *vice versâ*. If any thing similar could occur in the Narwhal; if the cranium might be twisted to the right instead of to the left, then the tusk also would most likely be twisted in the same uncommon direction." By such a theory as this, he urges, Scoresby's remarkable instance of a female Narwhal tusk, with a dextrorsal spiral, may be explained.

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* Museum Wormianum, 1655, p. 282 *et seq.*

† In Ephemerides Acad. Cæs. Leop. Nat. Cur. Dec. iii. Ann. vii. et viii. p. 350.

‡ Oss. Foss. v. p. 321.

§ Egede seems to have been aware of the existence of the second tooth. He probably learnt it during his residence in Greenland. His work was published in 1741. Comp. Egede's 'Greenland,' English transl. Lond. 1818, p. 77.

‖ Trans. Roy. Soc. 1813, p. 126.

¶ Odontography, p. 350. I can find no mention of this specimen in the sale Catalogue of Brookes's Museum.

There are now at least eleven bidental skulls in existence in different European museums, including the one at Cambridge. I have collected all the information I could about them, partly from personal observation, partly from the kindness of friends, and partly from books and figures.

1. Hamburg.—The celebrated specimen brought home in 1684 by Dietrich Petersen, Captain of the 'Golden Lion.' Female. It was originally deposited in the Museum of Herr Röding, a private collector of curiosities, but is now in the town museum, where I saw it in 1866. Unfortunately I had no opportunity of measuring it. The following dimensions are from Anderson[*]:—left tusk 7′ 5″ long, 9″ in girth; right 7′ long, and 8″ in girth. Figured originally by Anderson, whose engraver has made the right side the left, and *vice versâ*. His figure has been copied, with its errors, by Lacépède[†], and very badly, but corrected, by Klein[‡].

2. Copenhagen.—In the Zoological Museum of the University there is a complete adult skeleton with two fully developed tusks; a skull in a similar condition; and a skull with two very large tusks, but unfortunately much damaged. In the Museum of the Veterinary School is a fourth skull[§].

3. Christiania.—A very fine skull, sent from Copenhagen. I took the following measurements in 1866:—

Total length, from extremity of occipital condyles to end of longest tusk	101″
Length of exserted portion of longest tusk	6′ 5″
Girth	8″

The other tusk is now 6½″ shorter, but has been broken. Apparently they were originally of the same length. It is 7″ in girth at the same point as the other. The tusks diverge 2″ at their origin, 8″ from the end of the broken tusk to the opposite point of the entire one.

4. Amsterdam.—The skull figured by Vrolik[‖]. He gives no history of it; but Reinhardt believes it to be one that was sold in 1846 by the Directors of the Copenhagen Museum. It will be remarked that the right tusk is the longest. Vrolik believes it to be of a female, but, as Reinhardt considers, on no very sufficient grounds.

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[*] Nachrichten von Grönland.

[†] Histoire des Cétacés, pl. 9.

[‡] Hist. Piscium, Add. ad Missus ii. iii. iv. plate iii.

[§] These facts, which I noted in 1866, have been confirmed, and more accurately stated, in a letter kindly sent me by Prof. Reinhardt at the beginning of this year.

[‖] Vrolik, *l. c.*

5. Weimar.—In Froriep's Museum. The left tusk is fully developed, the right projects only a few inches beyond the skull. Figured by Albers*. Its authenticity has been questioned by Dr. Jäger; and undoubtedly the fact of the right tooth being so small renders it very necessary to examine the skull most carefully.

6. Hull.—In the Museum of the Philosophical Society. Procured in 1838 from a whaler. It is of a young animal, the left tusk measuring 20″, the right ½″, exclusive of the portion within the skull †.

7. Paris.—A young skeleton recently sent from Copenhagen, where it had been preserved for some years in the Museum stores. The longest tusk projects 2½′, the shorter one only a few inches.

Besides these, three others have been mentioned.

1. A skull sent down from Greenland in salt, and exhibited at Amsterdam in the 17th century. This fact rests on the authority of Zorgdrager‡, who says the longest tusk measured 6′, the shorter, which was broken, 1′.

2. Leuckart § saw a bidental skull at Vienna in 1841. The tusk on the right side was two-thirds shorter than that on the left. The spiral was sinistrorsal. This skull was certainly not there when I examined the collection in 1868. Possibly it was destroyed in the fire of 1848, which did great damage to the Museum.

3. Sowerby || mentions that a Narwhal came ashore at Friestone, in Boston Deeps, Feb. 15, 1800. He remarks, "it perfectly agreed with the name given by Linnæus, in having but one tooth, looking like a horn; but on examining the upper jaw, it was very evident that the other tooth had been lost; and we have since seen a perfect skeleton of the head of this animal with the two teeth fixed in their proper sockets." Unfortunately he gives no further particulars; so that one cannot judge whether his opinion was justified by the appearance of the skull, or rests merely on his own notions of symmetrical propriety.

It has been argued, by Rapp in the first instance, and by others since, that these bidental skulls are all forgeries. It might doubtless be possible to hollow out the right side of the skull in such a way as to admit of the insertion of a smaller tooth; and consequently those skulls where one tusk is much smaller than the other ought

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* Icones ad Anatomen comparatam illustrandam. It has been shown by both Vrolik and Jäger that Albers was wrong in citing *nine* other cases of bidental skulls. One only of his is truly bidental, No. 5, the Hamburg specimen. Nos. 1, 2, 6, and 7 are probably other figures of it; No. 3 is the Stuttgart specimen described by Reisel; No. 4 is that at Copenhagen, described by Tychonius; Nos. 8 and 9 are those figured by Sir E. Home. His error arose from regarding the undeveloped tooth on the right side as something abnormal, and as a genuine second tusk.

† These particulars have been most obligingly communicated to me by Mr. R. Harrison, Curator of the Museum.

‡ Zorgdrager, p. 33.

§ F. S. Leuckart, 'Zoologische Bruchstücke,' Stuttgart, 1841, p. 48. I owe this reference to Vrolik, p. 22, *l. c.*

|| Brit. Miscellany, Lond. 1806, p. 17, tab. ix.

to be submitted to the most rigorous examination. When, however, the two tusks are of the same, or of nearly the same size, as in my specimen (see figs. 1 and 2), I think deception is simply impossible; because any one can tell at a glance whether the right maxillary has increased in due proportion for the reception of a full-grown tooth *.

I find that Dr. R. Brown, in his account of the "Cetaceans of the Greenland Seas" (P. Z. S. 1868, p. 553), says, "double-horned ones (Narwhals) are not uncommon: I have seen them swimming about among the herd; and several such skulls have been preserved. Among others, there is a fine specimen, presented by Captain Graville, in the Trinity House, Hull. One of the teeth is 3′ long, and the other 4′." As I have never been in Greenland, and Dr. Brown has, it may seem presumptuous in me to doubt the accuracy of the first part of the above statement. But against Dr. Brown may be advanced the testimony of Scoresby †, who says, "Two or three instances have occurred of male Narwhals having been taken, which had two large external tusks. But this is a rare circumstance." The testimony of Crantz ‡ is to the same effect. Again, the great interest which was excited by the Hamburg specimen must surely have stimulated whalers to do their best to acquire so valuable a prize; and yet in 186 years only ten or eleven specimens have been obtained! Moreover I think we should always question the accuracy of any observation made from a ship's deck of animals that are swimming close together in a herd. It is so very easy to transfer the characteristics of one to another; nay, almost impossible to avoid doing so. For this reason I should be disposed to reject the instance cited by Sir E. Home §, who says, "A very intelligent captain in the Greenland fishery, who has gone thirty-five voyages, never saw a Narwhal with two tusks but once, and then from the masthead. The left appeared to be two-thirds longer than the right, and was above 5′ out of the water; the point of the right appearing just above the surface, so that the small one must have been about 3′." Surely it is most probable that the two tusks belonged to different animals. It is to observations of this kind that we owe the Dolphins with two dorsal fins, and other monstrosities of Cetacean literature.

On the other hand I was told by Mr. Wareham, the well-known dealer in china and curiosities, in whose shop I have had the opportunity of examining a great number of Narwhal tusks, bought by him out of the ship 'Diana,' of Hull, that the mate informed him that two of them were taken out of the same skull. I mention this fact, as it may indicate that whalers are indifferent to every consideration except that of getting as much ivory as possible, and do not stop to consider whether their prize has two tusks or one.

Dr. Brown has made a strange mistake with reference to the specimen from Hull, which he describes so particularly. Feeling anxious

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* Professor Flower tells me that there is a bidental cranium in the Warwick Museum with the tusk on the right side inserted artificially.

† Arctic Regions, i. p. 490.

‡ History of Greenland, i. p. 105.

§ Lectures, i. p. 259.

to verify his measurements, I wrote to the Curator of the Hull Literary and Philosophical Society, who replies, in a letter dated Jan. 13, 1871, "I cannot imagine where Mr. Brown obtained his information. I have been to the Trinity House, have seen some of the leading men, and have looked over their Museum; and there is no such thing as the skull of a Narwhal about the place! They have two large horns, fixed one on each side of a door, with a silver plate, and the name of the donor engraved thereon; but that is all belonging to the Narwhal; and they are very much surprised at the statement I made. I made inquiry of some other people, but could not gain any information. I then went to a friend of the Gravilles; and he told me he had never heard of the skull with two tusks, which he thought he should have done had there been such a thing. He said he knew the widow had several tusks, which were sold some time ago, as he saw them before they were sold. Captain Graville, the elder, was frozen to death some years ago in the Arctic Seas; and the said horns were sold some time after his death by his widow. I asked if he thought it possible that the son had any thing of the sort; and he replied that he had not, as he had lived next door to him for some time, and was very intimate with him, and he was quite certain that if he had possessed such a thing he should have been made acquainted with it."

There are several interesting questions about the dentition of the young Narwhal, which is said to have molar and incisor teeth; but it will be necessary to procure fresh specimens before any certain conclusions can be arrived at respecting them.

2. Descriptions of seven new Species of Australian Land Shells. By James C. Cox, M.D., C.M.Z.S.

[Received December 2, 1870.]

(Plate III.)

1. Helix gratiosa, sp. nov. (Plate III. figs. 1, 1 *a*.)

Shell imperforate, rather thin, globosely turbinated, finely striated with lines of growth, and, under the lens, irregularly transversely striated; yellow-brown, ornamented with two rather broad dark chestnut bands, one beneath the suture, the other above the centre of the body-whorl, and a third round the umbilical region; spire conoid, apex smooth; whorls 7, rather convex, the last somewhat inflated, rounded at the base; suture distinctly margined below with a rather broad white line; aperture ovately lunate, diagonal, purplish within; peristome expanded and reflexed, slightly thickened and dark; margins joined by a thin dark callus; columella broadly expanded and completely occluding the umbilicus.

Diameter, greatest 1·28, least 1·12; height 1·30 of an inch.

Hab. Whitsunday Island, off Port Denison, Queensland.

A fine showy species combining the characters of *Helix macleayi* and *Helix blomfieldi*, and found, in company with the former, rather abundantly.

2. HELIX COXENI, sp. nov. (Plate III. figs. 2, 2 *a*.)

Shell deeply, rather largely, and openly umbilicated, depressedly globose, very thin, translucent, light yellow-brown, irregularly striated with slightly raised waved striæ, irregularly studded with numerous sharp, rather long, fine recurved bristles; whorls 5½, last rapidly increasing in size, a little descending in front, and considerably inflated; aperture broadly oval, anterior margin scarcely everted, posterior broadly everted; columella much dilated, slightly covering the umbilicus, and produced beyond it; margins joined by a thin callus.

Diameter, greatest 0·97, least 0·70; height 0·63 of an inch.

Hab. Whitsunday Island, off Port Denison, Queensland.

I have named this species after Mr. Coxen of Brisbane, an ardent and enthusiastic collector of our Australian shells.

3. VITRINA SUPERBA, sp. nov.

Shell depressed, orbicularly auriform, light olive-green, rather opaque, shining; whorls 3, convex, rapidly increasing, last much expanded; spire scarcely raised, rounded, striated with lines of growth; aperture oblique, lunar-ovate, largely open; peristome simple, thin; columella sharply arched; margins widely separated.

Diameter, greatest 1·20, least 0·74; height 0·59 of an inch.

Hab. Mount Dryander, Port Denison, Queensland.

This fine species is, so far, the largest known. According to Reeve's figure it must closely resemble *Vitrina magnifica*, but is larger and more depressed.

4. HELIX BELLENGERENSIS, sp. nov.

Shell deeply, rather narrowly umbilicated, turbinately depressed, lenticular, thin, dark claret-brown, not shining; whorls 5½, coarsely obliquely striated, very gradually increasing in size, last whorl rather sharply keeled at the periphery and depressed in front; base convex; aperture rotundately lunar; last whorl suddenly contracted behind an everted peristome, which is white and slightly thickened; margins approaching; anterior margin inserted below the carina; columellar margin only slightly dilated.

Hab. Bellenger River, east coast of New South Wales.

Diameter, greatest 0·55, least 0·48; height 0·35 of an inch.

A simply lenticular species allied to *H. leucocheilus*, Cox, from which it differs in being more conical and more sharply keeled.

5. HELIX SARDA-LABIATA, sp. nov. (Plate III. figs. 3, 3 *a*.)

Shell deeply, openly, rather largely umbilicated, orbicularly conoid, thin, smooth, very finely striated throughout, pale fawn-grey; whorls 6, gradually increasing in size, the last sharply deflected in front; aperture oval, margins closely approximating, slightly thickened and reflexed, and of a polished pink carnelian appearance within; columellar margin triangularly dilated, overhanging the umbilicus.

Diameter, greatest 1·10, least 0·83; height 0·80 of an inch.

Hab. Mount Dryander, Port Denison, Queensland.

6. HELIX O'CONNELLENSIS, sp. nov. (Plate III. figs. 4, 4 *a.*)

Shell with a wide, open, funnel-shaped umbilicus, semiglobose, smooth, base flat and much excavated round the umbilicus, blackish chestnut, rather solid; spire obtuse; whorls 6; suture margined with a rather broad white line; aperture oval, lilac within, darker at the lip, which is expanded throughout; margins approaching, columellar margin broadly expanded and overhanging the funnel-shaped umbilicus.

Hab. The O'Connell River, Port Denison, Queensland.

Diameter, greatest 1·15, least 0·87; height 0·85 of an inch.

Closely allied to and resembling *H. rainbirdi*, Cox, in the excavated base around the umbilicus; but it is a smaller species, and easily distinguished from *H. rainbirdi* by its white-margined suture.

7. HELIX WHARTONI, sp. nov. (Plate III. figs. 5, 5 *a.*)

Shell deeply, openly umbilicated, depressedly globose, thin, finely striated, profusely banded with yellow and light-chestnut bands varying in width and slightly undulating; spire slightly raised; whorls 6½, rather flat, last whorl descending in front; aperture lunar-oval, margins approaching, joined by a thin callus; lip slightly thickened and everted; columellar margin triangularly dilated, half concealing the umbilicus; aperture pearly within.

Diameter, greatest 1·53, least 1·15; height 1·10 of an inch.

Hab. Port Denison, Queensland.

This is a very constant species, and in great abundance, showing but little variation. It is allied to *H. appendiculata*, Reeve, but is a thinner and lighter shell and more depressed.

DESCRIPTION OF PLATE III.

Figs. 1, 1 *a.* *Helix gratiosa*, p. 53.
2, 2 *a.* —— *coxeni*, p. 54.
3, 3 *a.* —— *sarda-labiata*, p. 54.
4, 4 *a.* —— *o'connellensis*, p. 55.
5, 5 *a.* —— *whartoni*, p. 55.

3. On some New or Rare Birds' Eggs.

By ALFRED NEWTON, M.A., F.R.S., V.P.Z.S.

[Received January 17, 1871.]

(Plate IV.)

In continuation of the notes which I have before (P. Z. S. 1861, p. 393, and 1867, p. 161) presented to the Society, I have for a third time the honour of offering to it some remarks on new or rare birds' eggs, which the kindness of several scientific friends has placed it in my power to make. In the present case these friends are (as on a former occasion) the authorities of the Smithsonian Institution (Professors Henry and Baird), Mr. E. L. Layard, and Dr. Cunningham.

1. LEUCOSTICTE GRISEINUCHA.

This, received from the Smithsonian Institution, is a perfectly white egg, measuring ·97 in. × ·67 in. I am not aware that the egg of any species of this genus has been before described.

2. THERISTICUS MELANOPIS. (Plate IV. fig. 8.)

I have already described this specimen in the 'Ibis' (1870, p. 502), and it is unnecessary for me now to say more about it than that I owe it to Dr. Cunningham.

3. CALIDRIS ARENARIA. (Plate IV. fig. 2.)

Mr. Gould has lately shown (B. Gr. Brit. part xi.) that hitherto nothing has been known with certainty about the breeding of this bird, one of the commonest winter visitants to the temperate regions of both New and Old Worlds. The egg has several times been announced as having been obtained; but the specimens so recorded differ materially from that which I now exhibit, as that also does from those figured by Thienemann (Fortpflanz. gesammt. Vög. t. lxii. fig. 2) and Bädeker (Eier europ. Vög. t. lxxi. fig. 5), so that I can hardly doubt that the egg now on the table is the first genuine Sanderling's which has been seen in Europe.

It was sent to me by the Smithsonian Institution; and the ticket accompanying it shows that it was procured by Mr. M'Farlane on the Barren Grounds of America, near the Anderson River; and the fact that the parent bird (♀) was shot leaves no room for doubt as to its authenticity and proper identification. It measures 1·43 in. × ·98 in. The nest was said to have been of hay and decayed leaves.

4. MACRORHAMPHUS GRISEUS.

This egg, not hitherto described, is also from the Smithsonian Institution. It resembles in general marking and colour that of a Redshank (*Totanus calidris*); but the specimen is unfortunately so much broken that I cannot give its dimensions, or propose that it should be figured in the Society's 'Proceedings.'

5. NUMENIUS BOREALIS. (Plate IV. fig. 1.)

Another of the generous gifts of the Smithsonian Institution, and interesting as the egg of a scarce straggler to the Old World. It shows in its appearance a connexion between the genera *Numenius* and *Limosa* (*L. lapponica*), and measures 2·04 in. × 1·43 in. It was obtained by Mr. M'Farlane from an Esquimaux on the Arctic coast of America, east of the Anderson River.

6. Numenius hudsonicus. (Plate IV. fig. 3.)

This egg has more of the normal appearance of *Numenius*. It measures 2·38 in. × 1·47 in., and was obtained by Mr. M'Farlane from an Esquimaux at Anderson Lower Fort.

7. Actodromas bairdi.

The egg of this lately distinguished species, which in its wanderings is not confined to the Old World (*cf.* Ibis. 1870, p. 151), is unfortunately broken, and I cannot give its dimensions. Enough, however, is left to show the style of colouring—pale yellowish-white ground with markings of brownish red and dull reddish violet. It was procured by Mr. M'Farlane, and the parent shot near the nest.

8. Chionis minor. (Plate IV. fig. 7.)

This was sent to me by Mr. Layard, who received it from the Crozette Islands. No egg of either species of the genus has been before known; and this confirms, by its appearance, the systematic position of the form shown by osteology, its affinity, namely, to the Plovers. It measures 2·23 in. × 1·48 in.

9. Xema sabinii. (Plate IV. fig. 5.)

In 1861 I had the pleasure of showing a much damaged specimen of this egg, obtained in Siberia by Dr. von Middendorff. The present, received with two others from the Smithsonian Institution, possesses precisely the same general characters. They measure respectively 1·78 × 1·23, 1·72 × 1·26, and 1·74 × 1·24, and were procured by Mr. M'Farlane at Franklin Bay, on the Arctic coast of America, east of the Anderson River. The hen bird was shot.

10. Chroicocephalus philadelphia. (Plate IV. fig. 6.)

Though this egg has before been received in this country from the Smithsonian Institution, it has never been figured or described; and this is the first I have possessed. It is very normal in appearance, and measures 1·8 in. × 1·29 in. It was also obtained by Mr. M'Farlane at Anderson-River Fort.

11. Larus franklini. (Plate IV. fig. 4.)

I am not aware that the egg of this bird has been hitherto known. It is also normal in character, and measures 2·13 in. × 1·43 in. It was transmitted from Manitoba to the Smithsonian Institution by Mr. L. D. Gunn.

12. Clangula albeola.

This is one of a nest of nine eggs sent to the Smithsonian Institution by Mr. M'Dougal, who procured it on the Youkon. It measures 1·63 in. × 1·23 in., and is of a yellowish-white colour, and smooth in grain, like a Teal's.

13. SOMATERIA V-NIGRUM.

One of eight eggs taken near St. Michael's, Norton Sound. It is smooth and of a pale olive-green, measuring 2·4 in. × 1·67 in.

14. CHEN HYPERBOREUS.

From the Arctic coast, eastward of the Anderson River. It is of a warm yellowish-white, but much obscured by dirt, and measures 2·93 in. × 2·09 in.

EXPLANATION OF PLATE IV.

Fig. 1. Egg of *Numenius borealis*, p. 56.
2. „ *Calidris arenaria*, p. 56.
3. „ *Numenius hudsonicus*, p. 57.
4. „ *Larus franklini*, p. 57.
5. „ *Xema sabinii*, p. 57.
6. „ *Chroicocephalus philadelphia*, p. 57.
7. „ *Chionis minor*, p. 57.
8. „ *Theristicus melanopis*, p. 56.

4. On *Hemicentetes*, a new Genus of Insectivora, with some Additional Remarks on the Osteology of that Order. By ST. GEORGE MIVART, F.R.S.

[Received January 17, 1871.]

(Plate V.)

HEMICENTETES MADAGASCARIENSIS.

Erinaceus madagascariensis, Shaw, Gen. Gool. i. 2. p. 458.

Erinaceus ecaudatus, Schreber, iii. p. 584, tab. 165*.

Erinaceus semispinosus, Cuvier, Règ. An. 1st edition, p. 136.

Setiger variegatus, Geoff. St.-Hilaire, Nouv. Dict. xxxii. p. 54.

Centenes semispinosus, Cuvier, Règne Anim. i. p. 125; Desmarest, Mamm. p. 162. no. 253.

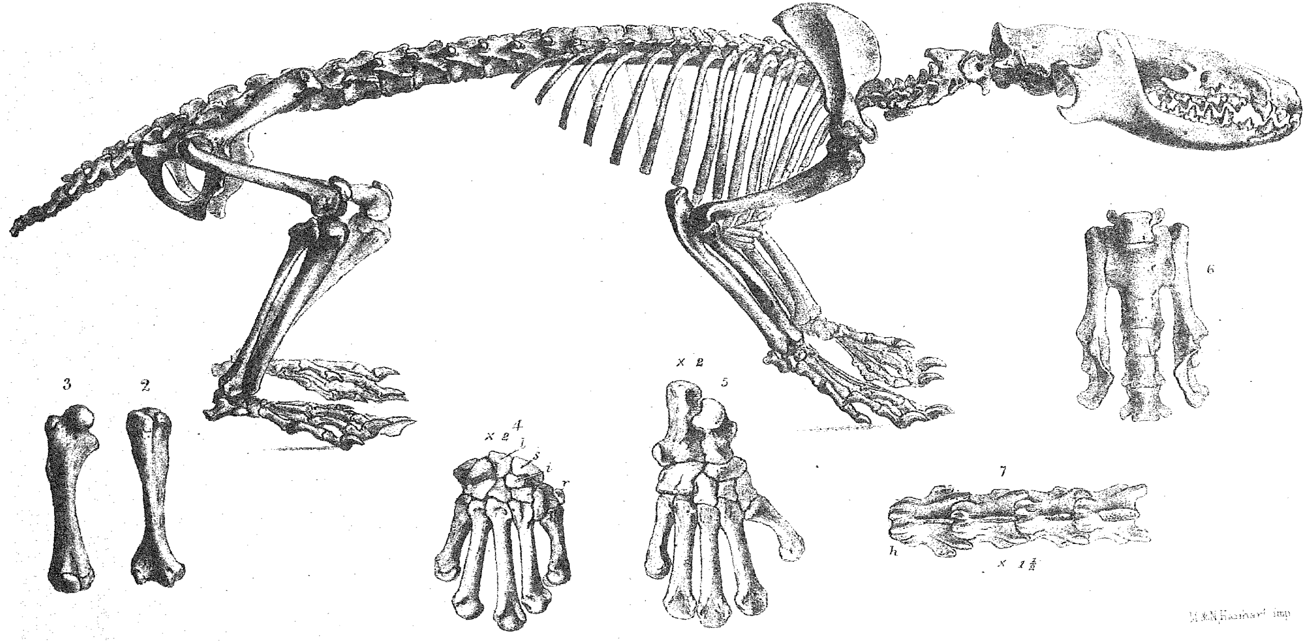
Centetes semispinosus, Fischer's Synopsis, p. 245. no. 3; Isid. Geoff. St.-Hilaire, Dict. Class. xvi. p. 41, and Magasin de Zoologie, 1839, pp. 15 and 32; Wagner, J. A. Schreb. Supplem. ii. pp. 35 and 553, and v. p. 583.

Centetes madagascariensis, Gray, Mag. Nat. Hist. 1836, and List of Mammalia in Brit. Mus. 1843, p. 82.

Le jeune Tanrec, Buffon, Hist. Nat. Suppl. iii. p. 214, tab. xxxvii.; Sonnerat, Voyage à la Chine, tom. ii. p. 146.

Asiatic Hedgehog, Pennant's Quadrupeds, ii. p. 236.

The curious insectivore the osteology of which is now, I believe, for the first time described, has been very long known, having been well figured by Buffon in 1776. Nevertheless it was considered by M. Isidore Geoffroy St.-Hilaire a species determined from imma-



Westley lith.

M & N Hanhart imp

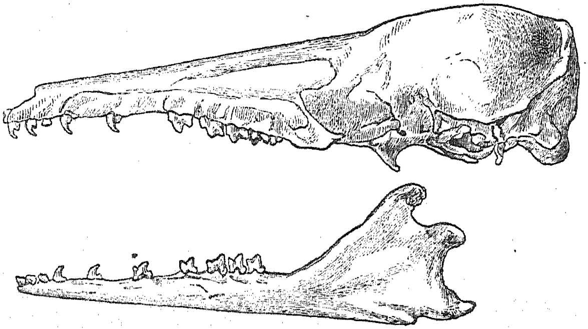
ERICULUS NIGRESCENS

ture specimens only *. Recently both our National Collection and the Museum of the Royal College of Surgeons have been enriched by skeletons of this species, and a very perfect and fully adult specimen in the possession of Mr. E. Gerrard has been very kindly lent me for description and to supply the figures herewith given.

These specimens have convinced me that the differences between the species now described and *Centetes ecaudatus* are of sufficient inportance to warrant the elevation of the former into a distinct genus.

The external characters are so well known already that I shall confine myself to a description of the skeleton and dentition, pointing out the resemblances and differences between these parts in *Hemicentetes* and in *Centetes*†.

Fig. 1.



Side view of skull, twice the natural size.

The skull is even more produced than is that of *Centetes*, but it is more tapering, more so, indeed, than in any insectivore, even *Talpa*. Thus, when looked at from above, it is much less cylindrical than in *Centetes*; and even when viewed laterally, it is at least as conical from behind forwards, in spite of the absence of the sagittal ridge which is so strongly marked in *Centetes*. The skull is broadest between the glenoidal surfaces, and then tapers forwards with considerable regularity. The orbits are not only incomplete behind, but there is not even any trace of a postfrontal process. Posteriorly the skull is rounded; but anteriorly the nares slope gently backwards, with a very elongated opening. There is no zygomatic arch, but the maxillary process projects more backwards and less outwards than in *Centetes*; it ends in a sharp, rather upwardly inclined point.

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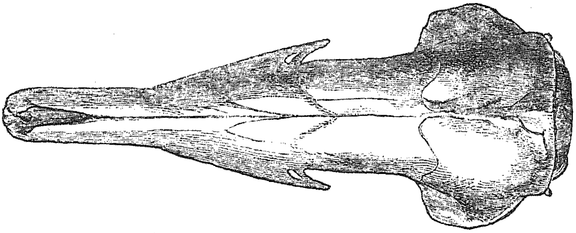
* He says, in 'Magasin de Zoologie,' 1839, p. 16, "il sera de toute évidence qu'elle n'a été établie que sur de jeunes sujets," and at p. 32, "On ne connaît que les caractères du jeune âge."

† For a description of the skeleton and dentition of *Centetes ecaudatus*, see the 'Cambridge Journal of Anatomy,' vol. i. (1867) p. 298, and vol. ii. (1868) pp. 138, 139, and 148.

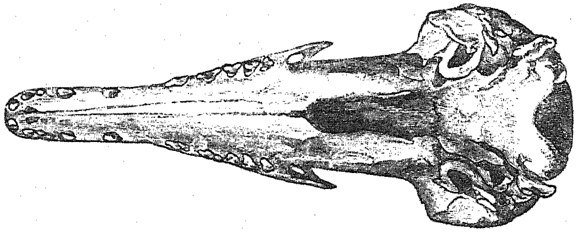
Fig. 2.



Upper view of skull, twice the size of nature.

There is no ridge or other process at the front of the orbit. As has been said, there is no sagittal crest, but a tolerably developed lambdoidal one which extends across from one glenoid surface to the other. The temporal fossa is much smaller than in *Centetes*; and the concavity which exists in the last-named genus, above and in front of the first upper premolar, is wanting in *Hemicentetes*. There is no marked concavity above the anterior opening of the infraorbital canal, or in the summit of the cranium between the orbits. The palate is very long and narrow, but of less equal width than in *Centetes*, expanding laterally to a greater degree from before backwards. Its posterior margin is not at all or only very slightly thickened (without any transverse bony plate behind such thickening when present), and with a deep, sharp median notch. The palate projects backwards considerably beyond the last molar; it is but very slightly concave antero-posteriorly, and has no median ridge running in that direction, nor any defects of ossification.

Fig. 3.



Base of skull, twice the size of nature.

Pterygoid fossæ cannot be said to exist, the ecto-pterygoid ridge not developing into a descending plate of bone, although distinctly perforated posteriorly. The pterygoid descends as a triangular lamella of bone ending in a delicate backwardly, downwardly, and outwardly directed hamular process. The meso-pterygoid fossa slightly narrows as it proceeds backwards, but does not end posteriorly (as in *Centetes*) in any hemispherical excavation between the basisphenoidal processes, which bend outwards to contribute to form the auditory bullæ. There is no conspicuous foramen in the place of that one which in *Centetes* is situated in the roof of the hemispherical basisphenoidal excavation. Instead of that one foramen there are two minute ones towards the anterior end of the inferior surface of the basisphenoid. The pterygoid region is much more bullate than in *Centetes*.

The foramen magnum is very large relatively, and looks almost directly backwards. On each side of it is a well-developed paroccipital process, anterior to which, but separated from it by an interspace, is a small process of the squamosal; so that there are two processes on each side as in *Centetes*, only that the mastoid (placed between them) contributes to neither, instead of to both of those processes as in the last named genus.

The small glenoid surface is bounded internally by a much smaller entoglenoid process than in *Centetes*. The tympanic bone is a mere ring.

The præmaxilla is very small, and does not nearly meet the anterior prolongation of the frontal as it does in *Centetes*. The nasals are distinctly separate for more than their anterior half, but they appear to anchylose together for their hindmost third. They extend backwards on the dorsum of the skull, about as far backwards as do the maxillæ. As in *Centetes* so in *Hemicentetes*, the parietals form more, and the frontals less of the roof of the cranium than in *Erinaceus*. The zygoma is wanting, only a small process extending backwards and outwards behind as well as above the last molar. As before said, the mastoid appears on the outer surface of the skull, where it is subtriangular, with the apex upwards, and not bifurcating inferiorly, as in *Centetes*.

The mandible has its ascending ramus only very slightly concave externally, its posterior margin between the condyle and the angle relatively much longer and more concave than in *Centetes*. On the other hand, the coronoid process is rather less raised relatively above the condyle. The inner surface of the ascending ramus above the dental foramen is much less concave. The horizontal ramus is not constricted behind the last molar. The condyle is rather elongated antero-posteriorly, and the distance from it to the coronoid process is not quite so great as from it to the mandibular angle. The last-mentioned part is flattened from above downwards, but so that it presents a slight horizontal projection, not only on the inside, but also on the outside of the vertical ramus.

There is a small, rather pointed than obtuse, prominence on the inferior margin of the mandible, a little distance in front of the angle. This is sharper than in *Centetes*.

There is a good-sized precondyloid foramen on each side, and in front of it a jugular foramen; but I have not observed a definite carotid foramen. There is a venous foramen in the posterior part of the squamosal, near its upper border, and a minute opening behind the glenoid surface. The foramen ovale appears to be formed entirely by the alisphenoid. The optic and sphenoidal opening is hidden by an alisphenoidal lamella. There is no long bony canal for the optic nerve to traverse, as in *Erinaceus*, nor is there any suboptic foramen, nor any conspicuous orbital one. There is an alisphenoid canal, with its posterior aperture situated just in front of the foramen ovale, but it is much less conspicuous than in *Centetes*. There is no external alisphenoid canal. There is a distinct posterior palatine foramen on each side. The spheno-palatine foramen is hidden, unless it appears as a minute opening in the lower part of the large infraorbital canal. The anterior palatine foramen on each side is relatively rather large. The infraorbital foramen is exceedingly large, very much larger relatively than in *Centetes*, bounded above by a very delicate spiculum of bone. The lachrymal foramen opens immediately behind the summit of that delicate spiculum.

There are two small foramina on the outer side of the very slender horizontal ramus of the mandible; the more anterior beneath the first premolar, the more posterior beneath the first molar.

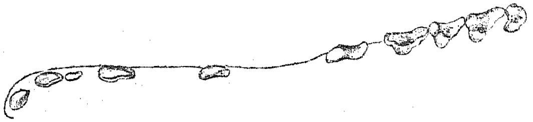
The dental formula is:—

$$\text{I. } \frac{3-3}{3-3}, \text{ C. } \frac{1-1}{1-1}, \text{ P.M. } \frac{3-3}{3-3}, \text{ M. } \frac{3-3}{3-3}=\frac{20}{20}=40.$$

The upper incisors on each side are all separate from each other and from the canine; and the first upper incisor is also separated by an interval from its fellow of the opposite side.

The first two incisors on each side are of nearly the same size and shape. Each is conical, pointed, and much hooked, with a very large posterior lobe.

Fig. 4.



Teeth of upper jaw, four times the size of nature.

The third incisor is much shorter, gradually broadening downwards from the socket to the distal edge.

The canine is shaped like the first two incisors, but rather larger, and with the posterior lobe relatively smaller. It is very much smaller, relatively as well as absolutely, than in *Centetes*.

The first premolar, in shape and size, is very much like the canine, though separated from the latter by an interspace, which is about three times as long as that which divides the canine from the third incisor.

The second premolar is shaped like the first premolar of *Centetes*. It is separated from the first premolar by an interval still greater than that which divides the first premolar from the canine.

It has a posterior talon, but no internal cusp. Compared with the premolar in front of it, it is much antero-posteriorly extended, *i. e.* less canine-like.

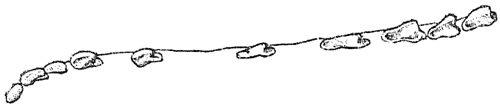
The third premolar is nearly contiguous to the second; it is much simpler than is the homologous tooth in *Centetes*. The principal cusp predominates less over the talon; and sometimes there is a minute cusp in front of the principal one. The tooth is as it were formed entirely of the cingulum, there seeming to be nothing answering to the normal principal cusps, still less to any internal cingulum. Nevertheless it is probable that the actual principal cusp is really made up of the normal external cusps, plus the cingulum, fused together.

The first and second upper molars are similar to the last premolar, except that the part answering to the normal cusps is more developed, and extending inwards, most so in the more posterior tooth, and showing that the principal cusp of the third premolar is (as before stated) probably of similar nature. The external cingulum develops two low subequal cusps. There is no internal cingulum.

The third and last upper molar is less in antero-posterior and very much less in vertical extent than is the tooth in front of it. Also the cingulum bears a smaller proportion to the rest of the tooth, which thus comes to consist of two subequal parts, one exterior, the other internal. All the molars are contiguous to each other and to the third premolar.

In the lower jaw the six incisors are much closer together than are those of the upper jaw. This is less due to their implantation than to the lateral expansion of their crowns. They are less vertinally extended than are the upper ones, and each expands upwards from the root to the cutting-edge.

Fig. 5.



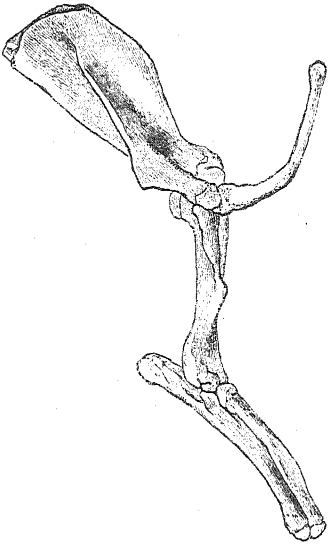
Teeth of lower jaw, four times the size of nature.

The canine is very much smaller, relatively as well as absolutely, than in *Centetes*. It is not received into any fossa in the upper jaw. It is a much curved conical tooth, with a considerable posterior cusp at its base. The first premolar, in size and shape, is quite like the canine in front of it. It is separated from the latter by a considerable interval.

The second premolar is quite like the first lower premolar of *Centetes*. In consists of three unequal cusps, without any internal production. The middle cusp is much the largest, and curved and pointed like the principal cusp of the first premolar.

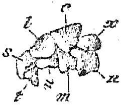
The third premolar projects inwardly hardly, if at all, more than the second; and it resembles the latter tooth in size and shape, except that the anterior of the three cusps is larger. The three true molars are very similar in size and shape to the third premolar, except that a cusp projects internally from the inner side of the posterior part of each. They resemble the homologous teeth of *Centetes*, squeezed together (as it were) from within outwards, while the posterior prism of each nearly aborts—thus approximating to *Chrysochloris*.

Fig. 6.



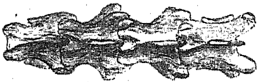
Scapula, clavicle, humerus, radius, and ulna: once and a half the size of nature.

Fig. 7.



Carpus, twice the size of nature.

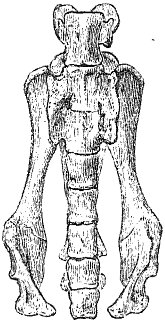
Fig. 8.



Vertebræ, once and a half the size of nature.

The skeleton of *Hemicentetes* closely resembles that of *Centetes*, except that the neural spines, especially the cervical ones, are relatively, as well as absolutely, less developed, and that the dorsolumbar vertebræ are twenty, or at most twenty-one, in number, instead of twenty-three or twenty-four as in *Centetes*. The pubic symphysis is also widely open in some individuals (probably females); and the humerus is not quite so long as the scapula. Moreover the os scaphoides is distinct from the os lunare; and there is no os intermedium.

Fig. 9.



Pelvis, once and a half the size of nature.

Since the publication of my paper on the osteology of the Insectivora* additional material has come to hand. Thus skeletons not only of *Hemicentetes* (formerly known as *Centetes madagascariensis*), but also new ones of *Rhynchocyon* and *Petrodromus*, have been added to the British Museum and the collection of the Royal College of Surgeons. At the last-named institution there has also been received a perfect skeleton of *Ericulus*, which is here figured by the kind permission of the Council and Curator.

Rhynchocyon.—As to this genus I am now able to add that the occipital foramen looks mainly backward, that the pterygoid fossa does not nearly extend so far forward as the hinder margin of the palate, that there is no paroccipital process, and that there is a very small mastoid process just behind the external auditory meatus, but a more marked projection at the lower end of the mastoid where it runs down behind the auditory bulla at the posterior end of the harmonia joining the tympanic to the petrosal.

I may also add that, in a skull in the British Museum, I find there are two minute teeth in the place of the first upper premolar. As the specimen is fully adult and the teeth even more worn than in the skull with the normal dentition, these small teeth can hardly belong to the milk-dentition.

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* See 'Cambridge Journal of Anatomy,' vol. i. (1867) p. 281, and vol. ii. (1869) p. 117.

Petrodromus.—In a new specimen, in which the last molars and the upper and lower anterior incisors are not in place, I have observed the following characters:—

There is no sagittal crest; the petro-mastoid, which is a single bone, is separate from the squamosal, which sends down a considerable entoglenoid process.

The anterior part of the auditory bulla is formed by the alisphenoid. The petrosal has a large cerebellar fossa.

A spatulate process extends backward from the middle of the hinder margin of the palate.

A small foramen perforates a process of the parietal, which descends between the alisphenoid and squamosal.

The rhinencephalic chamber is extensive. The second upper incisor has a small cusp at its base behind; and the lower incisors are bilobed *.

In this specimen there are but six lumbar vertebræ, and the internal condyle of the humerus is perforated.

Ericulus.—There is now a complete skeleton of this form in the Museum of the Royal College of Surgeons; and a plate representing it is here given by the kind permission of the authorities of that institution. It has 16 dorsal, 7 lumbar, 22 sacral, and about 12 caudal vertebræ. The spinous process of the axis is large, but the other cervical spines are quite rudimentary. The cervical transverse processes are not much antero-posteriorly expanded. The dorsal spines are but slightly elongated; but those of the lumbar vertebræ are very much enlarged and antero-posteriorly extended. The lumbar metapophyses, anapophyses, and transverse processes are small; but the lumbar spines have tolerably marked hyperapophyses. There are no hypapophysial processes. The manubrium is of moderate size and not keeled. The clavicles are elongated and slender.

Thus the genera of the order Insectivora yet known amount to 24 in number.

Insectivora.

Family I. Galeopithecidæ: Galeopithecus.
,, II. Macroscelididæ: Macroscelides, Petrodromus, Rhynchocyon.
,, III. Tupaiidæ: Tupaia, Ptilocercus, Hylomys.
,, IV. Erinaceidæ: Gymnura, Erinaceus.
,, V. Centetidæ: Centetes, Hemicentetes, Ericulus, Echinops, Solenodon.
,, VI. Potamogalidæ: Potamogale.
,, VII. Chrysochloridæ: Chrysochloris, Chalcochloris.
,, VIII. Talpidæ.
    Subfamily I. *Talpina*: Scalops, Scapanus, Condylura, Talpa.
    ,, II. *Myogalina*: Urotrichus, Myogale.
,, IX. Soricidæ: Sorex.

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* As observed by Dr. Peters in his 'Reise nach Mossambique,' i. Säugethiere, p. 95, tab. xxii. fig. 9.

With the corrections and additions* possible at this date the osteological characters of these groups may be stated as follows:—

GALEOPITHECIDÆ.

GALEOPITHECUS, Pallas†

Dentition: I. $\frac{2-2}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{2-2}{2-2}$, M. $\frac{3-3}{3-3}=34$. Cranium broad, depressed; muzzle obtuse; skull broadest between posterior roots of zygomata, which are complete and strong, but short; well-developed postorbital processes, sometimes enclosing orbits; margin of orbit sharp, with a small process in front; orbit large, temporal fossa rather small; a tympanic bulla; no alisphenoid canal; concave posterior margin of palate far forwards; pterygoid fossa minute; no basisphenoidal or paroccipital processes; large swollen mastoid process on each side; strong postglenoid process, tending much forwards; optic foramen large; foramen rotundum and sphenoidal fissure represented by one opening; a supraorbital, but no suboptic foramen; several small suborbital foramina on each side; anterior palatine foramina very large; lachrymal foramen small, opening within the orbit; upper canine and second incisor each with two roots; lower incisors pectinated; upper and lower molars very complex. Thirteen or fourteen dorsal, five or six lunar, five or six sacral, and many caudal vertebræ; ribs very broad; clavicles long, a scapholunar bone, but no os intermedium; ulna anchylosed to radius; fibula complete, but smallest towards its upper end; metatarsals shorter than digits; five digits to each extremity; a large cæcum.

Hab. South-eastern Asia and Indian archipelago.

MACROSCELIDIDÆ.

Dentition: I. $\frac{}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{3-3}{3-3}$. Skull broadest between posterior roots of zygomata, which are complete and rather deep; orbits not encircled by bone; generally no postorbital processes; dorsum of muzzle concave transversely; palate sometimes decidedly extending backwards beyond last molar; orbit large, temporal fossa very small; a tympanic bulla; no paroccipital process; no alisphenoid canal, malar imperforate; carotid, postglenoid, and suboptic foramina; one opening representing both sphenoidal fissure and foramen rotundum; foramen ovale large; lachrymal foramen opening well within the orbit; coronoid process of mandible not rising much, if at all, above condyle; canine close to premaxillary suture; last upper premolars not more vertically extended than the true molars; upper molars quadricuspid, the anterior and posterior cusps being connected by transverse ridges. Thirteen dorsal and six or eight lumbar vertebræ, lumbar transverse processes much extended antero-posteriorly; no hyperapophyses; hypapophyses beneath lumbar vertebræ; scapula with a long metacromion; clavicles slender; internal condyle of humerus perforated; scaphoid and semilunar separate; pelvic symphysis elongated; metatarsus as long as, or longer than, digits, and much longer than tarsus; sometimes only four digits; a cæcum.

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* Prof. Flower, in his 'Introduction to the Osteology of the Mammalia,' p. 149, has noticed the conditions of the tympanic in the different groups.

† Pallas, Act. Petrop. iv. 1. p. 208, tab. viii.; De Blainville, 'Ostéographie: Lemur,' pls. vi., viii., ix.; Waterhouse, Trans. Zool. Soc. ii. p. 335, pl. lviii.; Wagner, Schreb. Supplem. i. p. 318, v. p. 522.

Hab. Africa.

MACROSCELIDES[*], Smith.

Dentition: I. $\frac{3-3}{3-3}$, M. $\frac{3-3}{3-3}$ or $\frac{3-3}{4-4}$. Skull sometimes much inflated by air-cavities, always much contracted between orbits; no postorbital process; large defects of ossification in the palate; pterygoid fossa extending forwards to posterior margin of palate; suboptic foramen not conspicuous; infraorbital canal very short, the lachrymal foramen opening immediately above posterior termination of infraorbital canal; angle of mandible elongated; upper incisors and canines all of much the same size; third incisor with a single root; third lower molar but little smaller than the first or second. Six or seven lumbar vertebræ; cervical spines very rudimentary; ulna anchylosed to radius; five digits to each extremity.

Hab. Africa, including the the northern part.

PETRODROMUS[†], Peters.

Dentition: I. $\frac{3-3}{3-3}$, M. $\frac{3-3}{3-3}$. A strongly marked sagittal ridge; skull never much inflated; no postorbital process; large defects of ossification in the palate; pterygoid fossa extending forwards to the posterior margin of palate; suboptic foramen conspicuous; infraorbital canal short; angle of mandible elongated; first upper incisor very much larger than the second; third incisor with two roots; third lower molar but little smaller than the first or second; six or seven lumbar vertebræ; cervical spinous processes very small; ulna anchylosed to radius; five digits to the manus, four to the pes.

Hab. Eastern Africa.

RHYNCHOCYON[‡], Peters.

Dentition: I. $\frac{1-1}{3-3}$ or $\frac{0-0}{3-3}$, M. $\frac{3-3}{3-3}$. A strongly marked sagittal ridge; skull never inflated; cranium proper broad, flattened above and very little narrowed between the orbits; a marked postorbital process; no defects of ossification in the palate; pterygoid fossa extending not nearly so far forwards as the posterior margin of the palate; præmaxilla very small; suboptic foramen conspicuous; infraorbital canal very long, the lachrymal foramen opening in front of its posterior termination; angle of mandible very short; canine very much larger than the incisor, and with two roots; third lower molar considerably smaller than the first or second one. Eight lumbar vertebræ; cervical spines pretty well developed; ulna complete; only four digits to either manus or pes.

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[*] De Blainville, 'Ostéographie: Insectivores,' p. 57, pls. iii., v., vii., viii., x.; Wagner, Schreber. Supplem. ii. p. 81, v. p. 534; Duvernoy, Mém. de Strasb. i. tab. i., ii., iii. p. 50; Dr. Andrew Smith, 'Zool. South Africa,' pl. xv.; Prof. Peters, 'Reise nach Mossambique,' p. 87, tab. xxii.; Geoff. St.-Hilaire, Ann. Sc. Nat. 1829, xviii. pp. 165–173.

[†] Prof. Peters, 'Reise nach Mossambique,' p. 92, tab. xxii., xxiii.; Wagner, Schreb. Supplem. v. p. 538.

[‡] Prof. Peters, 'Reise nach Mossambique,' p. 100, tab. xxii., xxiii.; Wagner, Schreb. Supplem. v. p. 531.

Hab. Eastern Africa.

TUPAIDÆ.

I. $\frac{}{3-3}$, C. $\frac{1-1}{1-1}$, M. $\frac{3-3}{3-3}$. Skull broadest between the posterior roots of the zygomata, which are complete and slender; orbits enclosed by bone or at least a postorbital process; dorsum of muzzle convex transversely; a tympanic bulla; an external alisphenoid canal; molar perforated; carotid and postglenoid foramina, but no suboptic foramen; foramen ovale a narrow aperture widely separated from the spheno-orbital opening; lachrymal foramen at margin of orbit or rather without it; coronoid process of mandible rising much above condyle; canine not close to premaxillary suture; upper molars with four more or less marked principal cusps and an external cingulum, which tends to form, with the two outer principal cusps, two triangular prisms. Thirteen dorsal, five to seven lumbar vertebræ; lumbar transverse processes not much antero-posteriorly extended; well-developed hyperapophyses; no hypapophyses; scapula with only a rudimentary metacromion; clavicles slender; a scapho-lunar bone and os intermedium; pelvic symphysis elongated; tibia and fibula distinct*; metatarsus but very little longer than the tarsus; five digits to each extremity; a cæcum.

Hab. South-eastern Asia and the Indian archipelago.

TUPAIA†, Raffles.

Dentition: I. $\frac{2-2}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{3-3}{3-3}$, M. $\frac{3-3}{3-3}$. Skull much narrowed anteriorly; zygoma very slender; orbits large and completely encircled by bone; anterior margin of orbit sharply prominent; a process above the lachrymal foramen; temporal fossa very small; posterior margin of palate not thickened; small defects of ossification in palate; pterygoid fossa very small, and distant from palate; no paroccipital process; postglenoid process rudimentary; molar with a large perforation; foramen rotundum distinct from spheno-orbital fissure; a supraorbital foramen; infraorbital canal long and narrow; posterior palatine foramen large; cingulum of upper molars developing cusps; triangular prisms rather well developed; the two hinder upper premolars much more vertically extended than the true molars. Caudal vertebræ numerous.

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* I presume that *Ptilocercus* and *Hylomys* agree with *Tupaia* in this character.

† Horsfield's 'Zool. Researches,' 1824, 3 plates; Raffles, Linn. Trans. xiii. p. 257; Müller und Schlegel, Verhandl. 1839–1844; De Blainville, 'Insectivores,' pls. iii., vi., & x.; F. Cuvier's 'Dents des Mammifères,' no. xvii.; Owen's 'Odontography,' pl. cxi. fig. 3; Wagner, Schreb. Supplem. ii. p. 37, v. p. 525.

Hab. South-eastern Asia and Indian archipelago.

PTILOCERCUS*, Gray.

Dentition: I. $\frac{2-2}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{3-3}{3-3}$, M. $\frac{3-3}{3-3}$. Skull much narrowed behind the postorbital processes; orbits very nearly encircled by bone; the anterior margin of each not sharply prominent; no process above the lachrymal foramen; temporal fossa large; posterior margin of palate slightly thickened; no defects of ossification in palate; pterygoid fossæ distant from palate; a ridge-like paramastoid process; postglenoid process rather large; malar perforation very small; foramen rotundum and spheno-orbital fissure represented by a single opening; no supraorbital foramen; infraorbital canal large but very short; posterior palatine foramen very small; external cingulum of upper molars not developing distinct cusps; last upper premolar much more vertically extended than the true molars. Caudal vertebræ numerous.

Hab. Borneo.

HYLOMYS†, Müller and Schlegel.

Dentition: I. $\frac{3-3}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{4-4}{4-4}$, M. $\frac{3-3}{3-3}$. Skull not much narrowed anteriorly, rather so between the orbits; only a small postorbital process; a process above the lachrymal foramen; no defects of ossification in palate; pterygoid fossæ extending forwards to posterior margin of palate; malar with a small perforation; infraorbital canal rather large, but not much elongated; no supraorbital foramen; external cingulum of upper molars not developing cusps; last upper premolar much more vertically extended than the true molars. Caudal vertebræ few in number.

Hab. Java, Sumatra, and South-eastern Asia.

ERINACEIDÆ.

I. $\frac{3-3}{}$, C. $\frac{1-1}{1-1}$, M. $\frac{3-3}{3-3}$. Skull broadest between the posterior roots of the zygomata, which are complete though somewhat slender; no postorbital process; a ridge and process in front of orbit; temporal fossa large; pterygoid fossæ well developed; a transverse ridge at posterior part of palate, with a narrow transverse plate behind it; paroccipital and mastoid processes; nasals separate; malar imperforate, small, suspended in zygoma; tympanic a mere ring, not forming a bulla; a glenoid, but no distinct carotid foramen; foramen rotundum distinct from sphenoidal fissure; optic nerve traversing an elongated and very small canal; a suboptic foramen; infraorbital canal rather long; no true alisphenoid canal; lachrymal foramen opens just in front of orbit; ascending ramus of mandible very concave externally; first two upper molars quadricuspid, with an oblique ridge in each connecting the postero-external cusp with the antero-internal one. Fourteen or fifteen dorsal vertebræ and five or six lumbar vertebræ; no hyperapophyses or hypapophyses; all lumbar processes small; clavicles slender; scapula with a long, pointed metacromion process; ulna complete and distinct; a scapho-lunar bone and os intermedium; pubic symphysis very small or absent; fibula anchylosed below to tibia; metatarsus short; five digits to each extremity; no cæcum.

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* Gray, Proc. Zool. Soc. 1848, p. 24, and 'Zoology of Voyage of H.M.S. Samarang,' 1850, p. 18, pl. v.; Wagner, Schreber, Supplem. v. p. 528.

† Müller and Schlegel, Verhandl. i. p. 50, tab. xxv. figs. 4–7; Wagner, Schreber, Supplem. ii. p. 554, & v. p. 530; Blyth, Journal Asiatic Soc. Bengal, 1859, p. 293.

Hab. Europe, Asia, Africa.

Erinaceus [*], Linnæus.

I. $\frac{3-3}{2-2}$, P.M. $\frac{3-3}{2-2}$. Skull slightly constricted between the orbits; transverse plate behind the posterior palatine ridge continuous with outer walls of pterygoid fossæ; defects of ossification in palate; no external alisphenoid canal; mesopterygoid fossa ending posteriorly in an excavation of the *basis cranii*; suboptic foramen small and hidden; spheno-palatine foramen close to the foramen rotundum; upper canine small, generally with two roots; third upper and lower molars very small. Three sacral vertebræ; caudal vertebræ not numerous; spinous process of axis moderate; humerus generally with no supracondyloid foramen; tuberosity of ischium not much prolonged backwards; femur with a moderate ectogluteal ridge.

Hab. Europe, Asia, Africa.

Gymnura [†], Vigors and Horsfield.

I. $\frac{3-3}{3-3}$, P.M. $\frac{4-4}{4-4}$. Skull much constricted between the orbits; transverse plate behind posterior ridge of palate not continuous with outer walls of pterygoid fossæ; no defects of ossification in palate; an external alisphenoid canal; mesopterygoid fossa not ending posteriorly in any excavation; suboptic foramen large and conspicuous; spheno-palatine foramen remote from foramen rotundum; upper canine large and conical, with one root; third upper molar quadricuspidate; third lower molar quite like the second. Five sacral vertebræ; caudal vertebræ numerous; spinous process of axis very large; tuberosity of ischium much prolonged backwards; femur with a very strong ectogluteal ridge.

Hab. Malacca, Sumatra.

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[*] De Blainville, 'Insectivores,' p. 36, pls. vi., vii., viii., & x.; F. Cuvier, 'Dents des Mammifères,' no. xvi.; Owen, 'Odontography,' ii. pl. cx. fig. 5; Wagner, Suppl. ii. p. 10.

[†] De Blainville, 'Insectivores,' pls. vi. & x.; Owen, 'Odontography,' ii. pl. cxi. fig. 4; Horsfield and Vigors, Zoolog. Journ. iii. p. 246, pl. viii.; Wagner, Schreb. Supplem. ii. p. 45, v. p. 533.

CENTETIDÆ.

I. $\frac{2-2}{}$ or $\frac{3-3}{}$, C. $\frac{1-1}{1-1}$, M. $\frac{3-3}{3-3}$. Skull very cylindrical, broadest between the glenoid surfaces; no zygoma; no postorbital process; no process and, generally, no ridge in front of the orbit; temporal fossa large; no pterygoid fossa; tympanic a mere ring, not forming a bulla; paroccipital and mastoid processes; nasals more or less united; malar imperforate; a glenoid, but no distinct carotid foramen; foramen rotundum one with sphenoidal fissure; optic foramen very small, but not forming a long canal; no suboptic foramen; infraorbital canal short and wide; lachrymal foramen opening close to, or just in front of, anterior margin of orbit; a true alisphenoid canal; no external alisphenoid canal; upper true molars each forming one triangular prism, the two external principal cusps of a quadricuspid molar being here represented by a single prominence; lower true molars with very small posterior processes. Fifteen to nineteen dorsal vertebræ; lumbar processes small; no hypapophyses in the trunk, but distinct hyperapophyses; scapula with an obtuse metacromion process; a supracondyloid foramen to humerus; mostly an os intermedium; pubic symphysis very small, sometimes widely open; tibia and fibula distinct*; metatarsus short; five digits to each extremity; no cæcum.

Hab. Madagascar and West Indies.

CENTETES†, Illiger.

I. $\frac{2-2}{3-3}$ or $\frac{3-3}{3-3}$, P.M. $\frac{3-3}{3-3}$. No interorbital constriction; skull exceedingly cylindrical; posterior margin of palate thickened; mesopterygoid fossa ending posteriorly in an excavation of the *basis cranii*; slightly marked prominence from the inferior margin of the mandible, and placed some distance in front of the angle; a glenoid foramen; posterior palatine foramen large; no defects of ossification in palate; ascending ramus of mandible only slightly concave externally; canines long, pointed; apex of lower canine received into a fossa; first upper incisor small; second upper premolar not like the true molars; eighteen or nineteen dorsal vertebræ; a scapho-lunar bone; an os intermedium.

Hab. Madagascar.

HEMICENTETES, Mivart.

I. $\frac{3-3}{3-3}$, P.M. $\frac{3-3}{3-3}$. No interorbital constriction; skull exceedingly elongated and tapering anteriorly; nasals partly united; infraorbital canal very short and wide; lachrymal foramen opening just in front of the anterior margin of the orbit; mesopterygoid fossa not ending posteriorly in an excavation of the *basis cranii*; a slightly marked prominence at the inferior margin of the mandible, a little in front of the angle of the jaw; posterior palatine framina rather large; no defects of ossification in the palate; anterior incisors very strongly bilobed; canines small; apex of lower canine not received into a fossa; first premolar above and below like the adjacent canine; second premolar, both above and below, separated from the first premolar by a larger interval than that which divides the first premolar from the canine; molars with the antero-posterior diameter greatly exceeding the transverse diameter of the same tooth; posterior prism of lower molars almost aborted. Fifteen or sixteen dorsal vertebræ; no os intermedium; scaphoid and semilunar bones distinct; pubic symphysis very small, sometimes widely open.

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* I presume that *Echinops* agrees with the other genera of the *Centetidæ* in this character.

† De Blainville, 'Insectivores,' pls. iv., vi., & x.; F. Cuvier, 'Dents des Mammifères,' no. xix.; Owen, 'Odontography,' pl. cx. fig. 6; Wagner, Schreb. Suppl. ii. p. 30, v. p. 582.

Hab. Madagascar.

Ericulus[*], Is. Geoff.

I. $\frac{2-2}{2-2}$, P.M. $\frac{3-3}{3-3}$. No interorbital constriction; posterior margin of palate not thickened, and projecting much backwards beyond the last molars; mesopterygoid fossa ending posteriorly in an excavation of the *basis cranii*; no glenoid foramen; no defects of ossification in palate; posterior palatine foramen small; ascending ramus of mandible only slightly concave externally; canines not much elongated; second upper premolar shaped like the true molars; scaphoid and semilunar bones separate; an os intermedium. Sixteen dorsal and seven lumbar vertebræ; cervical spines rudimentary.

Hab. Madagascar.

Echinops[†], Martin.

I. $\frac{2-2}{2-2}$, P.M. $\frac{2-2}{2-2}$. No interorbital constriction; posterior margin of palate not thickened, and projecting a little beyond last molars; mesopterygoid fossa not ending posteriorly in an excavation of the *basis cranii*; posterior palatine foramen small; ascending ramus of mandible only slightly concave externally; first upper incisor much larger than the second; canines not much elongated; second upper premolar shaped like the true molars.

Hab. Madagascar.

Solenodon[‡], Brandt.

I. $\frac{2-2}{2-2}$, P.M. $\frac{4-4}{4-4}$. Skull not very cylindrical; cranium somewhat constricted between the orbits; posterior margin of palate thickened; a ridge in front of the orbit; mesopterygoid fossa not ending posteriorly in an excavation of the *basis cranii*; no paroccipital process; præmaxilla somewhat produced; ascending ramus of mandible deeply concave externally; condyle much transversely extended; a sharp process from the inferior margin of the mandible some distance in front of the angle; large glenoid foramen; posterior palatine foramen moderate; lachrymal foramen just in front of the orbit; first upper incisor much larger than the second; canine very small; apex of second lower incisor received into a fossa. Fifteen dorsal vertebræ; a scapho-lunar bone.

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[*] Is. Geoff. Mag. de Zool. 1839, p. 25; De Blainville, 'Insectivores,' pl. vi. & x.; Wagner, Schreb. Supplem. ii. pp. 33 & 551, & v. p. 584; Peters, Monatsber. Akad. Wissen. Berlin, 1865, p. 286.

[†] Martin, Trans. Zool. Soc. ii. p. 249, pl. xlvi.; Peters (*Echinogale*), Monatsbr. Akad. W. Berlin, 1865, p. 286; Wagner (*Echinogale*), Schreb. Supplem. ii. pp. 30 & 549, v. p. 585.

[‡] Brandt, Mém. de Pétersb. 1833, 6th series, ii.; F. Poey, 'Memorias sobra la historia natural de la Isla de Cuba,' i. Habana, 1851, p. 23; Peters, Abhandlungen der K. Akad. der Wissen. zu Berlin, 1864, p. 1, pls. 1–3; De Blainville, 'Insectivores,' p. 53, pls. v. & ix.; Owen, 'Odontography,' pl. cxi. fig. 1; Wagner, Schreb. Supplem. ii. p. 79, v. p. 566.

Hab. Hayti and Cuba.

POTAMOGALIDÆ [*].

POTAMOGALE, Du Chaillu.

Dentition: I. $\frac{3-3}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{3-3}{3-3}$, M. $\frac{3-3}{3-3}$. Skull not cylindrical; broadest between the glenoid surfaces; no zygoma; no postorbital process; no ridge or process in front of the orbit; temporal fossa large; no pterygoid fossa; no tympanic bulla; paroccipital processes directed backwards; nasals united; molar imperforate; very large precondyloid perforations; a small glenoid, but no distinct carotid foramen; foramen rotundum one with sphenoorbital fissure; optic foramen very small, but not forming a long canal; a suboptic foramen; infraorbital canal short and wide; no lachrymal foramen; a true alisphenoid canal; no external alisphenoid canal; upper true molars each forming two very narrow and approximated triangular prisms, the two external principal cusps of a quadricuspid molar being represented by two distinct prominences; lower true molars with rather large posterior processes. Sixteen dorsal vertebræ; caudal vertebræ numerous; lumbar processes small; decided hyperapophyses; scapula without a metacromion; no clavicles; no supracondyloid foramen to humerus; ulna complete and distinct; scaphoid and semilunar bones separate; no os intermedium; pubic symphysis very small; tibia and fibula anchylosed together below; five digits to each extremity; no cæcum.

Hab. Old Calabar.

CHRYSOCHLORIDÆ [†].

I. $\frac{3-3}{3-3}$, C. $\frac{1-1}{1-1}$, M. $\frac{3-3}{3-3}$. Skull very broad and high, tapering sharply forwards; greatest breadth between the posterior roots of the zygomata, which are complete and rather deep arches; no postorbital process; occiput not sloping much forwards; præmaxillæ peculiarly produced; lambdoidal ridge traversing summit of cranium; no ridge or process in front of orbit; a tympanic bulla; no alisphenoid canal; no pterygoid fossa; no paroccipital process; glenoid surface very small; ascending ramus of mandible very low, peculiarly truncated; coronoid process very low, a carotid foramen; a small glenoid foramen; sphenoidal fissure and foramen rotundum represented by one opening; infraorbital foramen large and single; lachrymal foramen minute; true molars each in the form of a triangular prism; first upper incisor larger than the second; canine small. Nineteen or twenty dorsal vertebræ; cervical neurapophyses not very narrow antero-posteriorly; no cervical hypapophyses; spines of dorsal and lumbar vertebræ well developed; no hyperapophyses; no hypapophysial ossicles beneath the lumbar vertebræ; manubrium slightly keeled, but not much enlarged; clavicles long and very slender; humerus not very short; ulna complete and distinct; scapula broad, with a blunt metacromion; scaphoid and semilunar distinct; no sickle-shaped carpal ossicle or os intermedium; pelvis widely open below; tibia and fibula anchylosed together inferiorly; four digits to manus, five to pes; no cæcum; an ossified tendon in the forearm.

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[*] Prof. Allman, Trans. Zool. Soc. vi. p. 1, pls. i. & ii.; Prof. J. V. Barboza du Bocage, 1ª Classa da Academia de 27 d'Abril, 1865, Lisbon, described under the name *Bayonia velox*; Peters, Monatsbr. Akad. W. Berlin, 1865, p. 286.

[†] De Blainville, 'Insectivores,' pls. v., vii., viii. & ix.; F. Cuvier, 'Dents des Mammifères,' no. xviii.; Owen, 'Odontography,' pl. cx. fig. 1; Wagner, Schreb. Supplem. ii. p. 118, v. p. 579; Peters, 'Reise nach Mossambique,' p. 69, tab. xxii.

Hab. Southern and Eastern Africa.

CHRYSOCHLORIS, Lacépède.

M. $\frac{3-3}{3-3}$; a vesicular enlargement in the temporal fossa; lower molars without any posterior process.

CHALCOCHLORIS, St. G. Mivart.

M. $\frac{2-2}{2-2}$; no enlargement in the temporal fossa; lower molars with a marked posterior process.

TALPIDÆ.

C. $\frac{1-1}{}$, M. $\frac{3-3}{3-3}$. Cranium very broad behind, but not high; tapering much, but gradually, forwards; greatest breadth behind the posterior roots of the zygomata, which are complete but exceedingly slender arches; occiput inclined much forwards; no postorbital process; no ridge or process in front of the orbit; temporal fossa small; a tympanic bulla; no alisphenoid canal; mesopterygoid fossa not ending posteriorly in any excavation of the *basis cranii*; foramen magnum very large; no paroccipital or mastoid processes; glenoid surface small, and situated high up; no distinct postglenoid process; ascending ramus of mandible not very low; supraoccipital enormous; generally a large pterotic; meatus auditorius externus opening decidedly below the glenoid surface; a carotid, but no glenoid foramen; foramen rotundum and spheno-orbital fissure represented by one opening; infraorbital foramen very large; lachrymal foramen very small; molars above and below, each formed of two triangular prisms. Cervical neurapophyses very narrow antero-posteriorly; no cervical hypapophyses; spines of dorsal and lumbar vertebræ small; no hyperapophyses; autogenous hypapophysial ossicles beneath the interspaces of the lumbar vertebræ; manubrium keeled; scapula long and very narrow; radius and ulna distinct; an os intermedium; no symphysis pubis; tibia and fibula confluent below; five digits to each extremity; no cæcum.

Hab. Europe, Asia, including Japan, and North America.

TALPINA.

No distinct pterygoid fossa*; pterygoid region inflated; coronoid process not very elevated; spiculum of bone bounding infraorbital foramen above very narrow; as many as three incisors above; manubrium very elongated; clavicles very short and broad; no metacromion process; a sickle-shaped carpal ossicle.

Hab. Europe, Asia, North America.

TALPA†, Linnæus.

I. $\frac{3-3}{2 \text{ or } 3-3 \text{ or } 2}$, C. $\frac{1-1‡}{1-1}$, (?) P.M. $\frac{4-4}{4-4}$, M. $\frac{3-3}{3-3}$. Cranium very slightly constricted between the orbits; palate with no posterior thickening, but a small defect of ossification on each side; a very large pterotic; a fissure bordering epiotic; posterior palatine foramen large; anterior palatine foramen small; all the incisors very small; upper canine very elongated; lower canine small; posterior cusps of premolars very small. Five or six lumbar vertebræ; caudal vertebræ few; ultimate phalanges of manus much the longest, bifurcating.

Hab. Europe and Asia.

CONDYLURA §, Illiger.

I. $\frac{3-3}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{4-4}{4-4}$, M. $\frac{3-3}{3-3}$. No fissure bordering epiotic; meatus auditorius with a very large external opening; muzzle much attenuated anteriorly; first and third upper incisors much larger than the second; upper canine very small; lower canine much larger than lower incisors; lower third incisor much smaller than the first or second; posterior cusps of premolars very large. Seven lumbar vertebræ; caudal vertebræ numerous; ultimate phalanges of manus not bifurcating.

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* I cannot be sure as to *Condylura* in this respect.

† De Blainville, 'Ostéographie: Insectivores,' pls. i., v., & ix.; F. Cuvier, 'Dents des Mammifères,' no. xxii.; Owen, 'Odontography,' pl. cx. fig. 3; C. Giebel, Zeitschr. f. d. ges. Naturwiss. Halle, Bd. xii. 1858, pp. 395–450; Wagner, Schreb. Supplem. ii. p. 106, v. p. 576.

‡ Mr. C. Spence Bate, F.R.S., in a paper read at the Odontological Society of Great Britain (published in the 'Annals and Mag. of Nat. Hist.' for June 1867), states that the tooth here called canine is implanted in the præmaxilla. The conflicting nature, however, of the remarks contained in that paper render other observations necessary.

§ De Blainville, 'Insectivores,' pls. i., v., & ix.; F. Cuvier, 'Dents des Mammifères,' no. xxii. bis; Wagner, Schreb. Supplem. ii. p. 113, v. p. 574; S. F. Baird, 'Mammals of America,' p. 71.

Hab. North America.

SCAPANUS[*], Pornel.

I. $\frac{3-3\dagger}{3-3}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{4-4}{4-4}$, M. $\frac{3-3}{3-3}$. No fissure bordering the epiotic; cranium with a very slight interorbital constriction; palate not extending back beyond the last molars; first upper incisor much larger than the second or third one; the two upper posterior incisors, the upper canine, and first two premolars all of nearly the same size; lower incisors, canines, and premolars very gradually increasing in size from before backwards.

Hab. North America.

SCALOPS[‡], Cuvier.

I. $\frac{3-3}{2-2}$, C. $\frac{1-1}{0-0}$, P.M. $\frac{3-3}{3-3}$, M. $\frac{3-3}{3-3}$. Cranium with a very marked interorbital constriction; no fissure bordering the epiotic; palate extending back beyond the last molars; first incisor very large, second and third minute; upper canine long and conical, and much more vertically extended than the first upper premolar; second lower incisor much larger than the first.

Hab. North America.

MYOGALINA.

A distinct pterygoid fossa; pterygoid region not inflated; no open fissure bordering opiotic; coronoid process very lofty; never as many as three incisors above[§]; first upper incisor longest tooth of upper jaw; manubrium not very large; clavicle and humerus elongated; a metacromion process; no sickle-shaped carpal bone.

MYOGALE[‖], Cuvier.

I. $\frac{2-2}{2-2}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{5-5}{5-5}$, M. $\frac{3-3}{3-3}$. Cranium with a very marked interorbital constriction; palate prolonged beyond the last molar, its posterior margin thickened; a large perforation in each exoccipital; anterior palatine foramen very large; infraorbital foramen bounded above by a broad spiculum of bone; the *very* small lachrymal foramen opens at the anterior side of the upper end of the spiculum; first upper incisor the largest and longest of all the teeth; second upper incisor very small. Cervical neurapophyses mere filaments; many caudal vertebræ; pes rather or very elongated, both absolutely and compared with manus.

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[*] Pornel, Bulletin de la Soc. Géologique de France, 1849, vi.; S. F. Baird, 'Mammals of N. Western America,' p. 58, pl. xxx.; Le Conte, Proc. of Acad. of Philadelphia, vi. p. 326; Bachman, Journ. Acad. Nat. Sci. Phil. viii. 1839, p. 58; Wagner, Schreb. Supplem. v. p. 574.

[†] Prof. Peters considers that there are but four upper incisors.

[‡] De Blainville, 'Insectivores,' pls. v. & ix.; F. Cuvier, 'Dents des Mammifères,' xxii.; Owen, 'Odontography,' pl. cx. fig. 2; Giebel, Zeitschr. f. d. ges. Naturwiss. Halle, Bd. xii. 1858, pp. 395–405; Wagner, Schreb. Supplem. ii. p. 102, v. pp. 571, 807; Baird, 'Mammals of America,' p. 58, pl. xxx.; Bachman, Boston Journal N. H. 1843, ii. p. 28; Le Conte, Proc. of Acad. of Philadelphia, vi. p. 326.

[§] Possibly there may also be only four upper incisors in *Scalops* and *Scapanus*.

[‖] J. F. Brandt, Archiv fur Natur. 2 Jahrg. 1836, i. p. 176; Geoff. Mém. du Mus. i. tab. xv. figs. 10–12, 1815; De Blainville, 'Insectivores,' pls. ii., v., and ix.; F. Cuvier, 'Dents des Mammifères,' no. xxi.; Wagner, Schreb. Suppl. ii. p. 95, v. p. 567.

Hab. Eastern and Western Europe.

UROTRICHUS *, Temminck.

I. $\frac{2-2}{1-1}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{4-4}{4-4}$, M. $\frac{3-3}{3-3}$. Lachrymal foramen immediately above the middle of the infraorbital foramen; no large exoccipital perforation; infraorbital foramen bounded above by a very slender spiculum of bone; second upper incisor of considerable size, though not nearly so large as the first incisor. Few caudal vertebræ; pes not elongated.

Hab. Japan and Western N. America.

SORICIDÆ.

SOREX †, Linnæus.

I. $\frac{4-4}{1-1}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{2-2}{1-1}$, M. $\frac{3-3}{3-3}$,
or I. $\frac{3-3}{1-1}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{2-2}{1-1}$, M. $\frac{3-3}{3-3}$,
or I. $\frac{3-3}{1-1}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{1-1}{1-1}$, M. $\frac{3-3}{3-3}$,
or I. $\frac{2-2}{1-1}$, C. $\frac{1-1}{1-1}$, P.M. $\frac{1-1}{1-1}$, M. $\frac{3-3}{3-3}$.

Cranium broad behind, tapering forwards; greatest breadth behind the glenoid surfaces; no postorbital process; occiput sloping much forwards; no pterygoid fossa; no zygoma; pterygoid region not inflated; mesopterygoid fossa ending posteriorly in no excavation of the *basis cranii*; tympanic a mere ring, not forming a bulla; no alisphenoid canal; a large aperture on each side of the base of the skull; large and anteroverted postglenoid processes; foramen rotundum and sphenoidal fissure represented by one opening; infraorbital foramen considerable, limited above by a thick bar of bone; inside of ascending ramus of mandible with a peculiar and deep excavation; articular surface of condyle looking backwards; angle very attenuated; first incisor much larger than the others, and always with two cusps; upper canine always smaller than the smallest upper incisor; upper molars with two triangular prisms; lower incisor very elongated; lower canine smallest tooth of mandible. Thirteen to fifteen dorsal vertebræ; five or six lumbar vertebræ; large cervical hypapophyses; no lumbar hypapophysial ossicles; well-marked hyperapophyses; manubrium broad, but not keeled; clavicle small and slender, not joining humerus; scapula short and broad; a bifurcating acromion process; generally a supracondyloid foramen in humerus; radius and ulna distinct; no sickle-shaped bone or os intermedium in carpus; ultimate phalanges not bifurcating; pelvis narrow, symphysis widely open; femur with a third trochanter; tibia and fibula confluent below; five digits to each extremity; no cæcum.

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* Temminck, 'Fauna Japon.' i. p. 22, tab. iv. figs. 6–11; Wagner, Schreber, Suppl. v. p. 569; Spencer F. Baird, 'Mammals of America,' p. 76, pl. xxviii.

† De Blainville, 'Insectivores,' pls. ii., v., and x.; F. Cuvier, 'Dents des Mammifères,' no. xx.; Owen, 'Odontography,' pl. cx. fig. 4; Duvernoy, Magasin de Zoologie, 1842; Wagner, Schreb. Suppl. i. p. 47, v. pp. 539 and 802; Dr. E. Brandt, Russian Memoir of 1865, before referred to; Spencer F. Baird, 'Mammals of America,' pp. 7–56.

Hab. The Old World, and North America.

DESCRIPTION OF PLATE V.

Fig. 1. Skeleton of *Ericulus*, slightly less than the natural size.
2. Right humerus, seen in front.
3. Right femur, seen in front.
4. Right carpus and metacarpus, twice the natural size: *i*, os intermedium; *l*, lunare; *r*, radial sesamoid ossicle; *s*, scaphoides.
5. Right tarsus and metatarsus, twice the natural size.
6. Pelvis seen on its abdominal side, showing the separation of the pubic bones.
7. Four lumbar vertebræ, once and a half the natural size: *h*, hyperapophysis.

5. Descriptions of some new Species of Exotic Lepidoptera. By Arthur Gardiner Butler, F.L.S., F.Z.S., &c.

[Received January 11, 1871.]

Genus Amauris, Hübner.

Amauris inferna, n. sp.

Front wings above as in *A. egialea*, but the two large central hyaline patches wider apart, and the two central spots of the oblique subapical series placed as in *A. echeria*. Hind wings above and below almost as in *A. hecate*, but the shape of *A. damocles*. Front wings below with paler apical area; three white points at centre of outer margin.

Expanse of wings 3 inches 6½ lines.

Hab. West Africa. Coll. W. W. Saunders.

Genus Danais, Latreille.

Danais ino, n. sp.

Front wings as in *D. limniace*, but with only three small spots in the oblique series beyond the cell; the interno-basal streaks united in the middle. Hind wings almost as in *D. choaspes*; no discoidal black streak, but the basal patch between median and submedian nervures divided by a streak, as in *D. limniace*. Wings below spotted and streaked as above; the apex of front wings and the whole of hind wings brownish ochraceous.

Expanse of wings 3 inches 2½ lines.

Hab. Sula (*Wallace*). Coll. W. W. Saunders.

The natural position of this species is between *D. australis* and *D. choaspes*.

Genus ROMALEOSOMA, Blanchard.

ROMALEOSOMA JANETTA, n. sp.

Front wings above blue-black, the interno-basal area yellowish green; a large green-tinted yellow subapical patch. Hind wings green; yellowish towards apical area; a red spot between bases of costal and subcostal nervures; apex to second median branch broadly black, exhibiting a submarginal series of blacker spots, edged externally with green, and continuing to interspace between first and second median branches; anal margin narrowly black; internal area brown. Body dark brown. Wings below nearly as in *R. cato*, but the black spots differently disposed; both wings plum-coloured at base.

Expanse of wings 3 inches 8 lines.

Hab. Fantee, Cape Coast (*Ussher*). Coll. Swanzy.

We have this species also in the British Museum; it comes nearest to *R. cato*, from which, however, it is readily distinguishable.

Genus HARMA, Westwood.

HARMA LURIDA, n. sp.

♂. Wings above golden ochraceous, basal area (including almost the whole of hind wings) orange, tinted and dusted with brown atoms; the margin narrowly and regularly black-brown. Hind wings with a submarginal series of black spots, nearly touching the brown border, and towards anal angle a discal series of three or four hastate spots; abdominal margin black-brown. Body brown. Wings below greyish brown, with central dark ferruginous line from third median branch of front to anal angle of hind wings; the usual discoidal rusty black-edged markings and three pale spots near the base; outer margin varied with white and bounded internally by a double lunated brown line; a submarginal series of black and white points.

Expanse of wings 3 inches.

Hab. Fantee, Cape Coast (*Ussher*). Coll. Swanzy.

Belongs to the *Egesta* group.

Genus ATERICA, Boisduval.

ATERICA FELICIA, n. sp.

♀. Wings above brown. Front wings with usual ochre-encircled discoidal markings; basal area terminated by a narrow, strongly arched, and somewhat angulated ochreous streak; a discal chain-band and submarginal line also ochreous; three white points near apex. Hind wings—basal area abruptly limited by a somewhat arched and wedge-shaped ochreous patch, which towards the apex unites with a geminate ochraceous chain-band enclosing internally black hastate spots. Body above blackish. Wings below greyish, paler than above. Front wings with white oblique band; chain-like markings less distinct than above. Body below grey.

Expanse of wings 2 inches 11½ lines.

Hab. Fantee, Cape Coast (*Ussher*). Coll. Swanzy.

Allied to *A. opis*, Drury.

ATERICA ZONARA, n. sp.

♂. Wings above tawny, with three macular brown bands, the outermost distinctly separated into spots; the costa and outer margin of front wings, some irregular basal characters, the base of hind wings, and a submarginal broken line in hind wings dark brown; fringe blackish. Body above dark tawny. Wings below pale tawny; a dentate, sinuate, submarginal brown line, and a series of black discal points. Front wings with a black spot, and 8-shaped marking within the cell; a second marking, less distinct, at end of cell, and a series, very indistinct, terminating basal area; a squamose, oblique, blackish streak from apex to below first median branch. Hind wings with three black spots in cell, which is surrounded by an irregular series of tawny blackish-edged markings, enclosing a pale notched lunate patch, which crosses discocellular, median, and submedian interspaces. Body below greyish.

Expanse of wings 2 inches 4 lines.

♀. Wings above brown, with pale ochreous markings answering to ground-colour of male; hind wings with pale ochreous patch, nearly as in the preceding species, but narrower and more diffused externally; wings below as in the male, but paler.

Expanse of wings 2 inches 6 lines.

Hab. Fantee, Cape Coast (*Ussher*). Coll. Swanzy.

Belongs to the *Absolon* group.

Genus DEILEPHILA.

DEILEPHILA SPINIFASCIA, n. sp.

Intermediate between *D. livornica* and *D. galii*. Front wings with a pale median ochraceous band, as in *D. livornica*, throwing off five or six recurrent spine-like streaks along nervures towards costal area. Hind wings as in *D. galii*, excepting that the white spot near anal angle is placed above the line of the rosy band, and is bounded on both sides by black. Body differs from that of *D. galii* in that it exhibits five, more or less, black decreasing bands on each side of the central brown stripe. Wings below freckled with blackish scales, otherwise almost as in *D. galii*.

Expanse of wings 3 inches.

Hab. Buenos Ayres (*Burmeister*). B.M.

This species, the following, and *Dirphia venata* were sent to the

British Museum some time ago, with the request that (in case of their proving to be new) I should describe them.

Genus SPHINX.

SPHINX DIFFISSA, n. sp.

Wings above greyish ochraceous; fringe alternately brown and white. Front wings with an irregularly dentated waved black line, edged interiorly with whitish from costa to near anal angle, and united with apex near costa by an irregular oblique broken black line; basal area irregularly marbled and streaked with dark grey scaling; a whitish point at end of cell, and another quite white at base. Hind wings pale grey, crossed by two white bands, bounded on either side by blackish; the outermost blackish border broad, especially towards costa, and terminating at anal angle. Thorax greyish ochraceous, marbled with blackish; a yellow point on each side of the collar. Abdomen black at base, with a yellow point on each side; a central grey-brown stripe, and on either side a series of five golden-yellow spots, encircled with black. Wings below pale greyish ochraceous; a whitish band traversing the wings from costa of front to anal angle of hind wings. Body pale greyish.

Expanse of wings 3 inches 6 lines.

Hab. Buenos Ayres (*Burmeister*). B.M.

Allied to *S. carolina* and *S. lucetius.*

Genus PERICOPIS, Hübner.

PERICOPIS ROSINA, n. sp.

♀. Wings above brown; front wings with three broad and almost connected semihyaline bands, the first at base, the second from centre of costa to near anal angle, the third (just beyond and almost touching the second) from costa to near centre of outer margin; a red point at base. Hind wings blackish, with a narrow submarginal, anal, rosy, macular band, and two spots of the same colour between median and subcostal branches; three or four nearly marginal anal white points; fringe brown. Body blackish. Wings below rather paler; front wings with darker basal area; apical area exhibiting two broad white patches in place of the two exterior bands of upper surface. Hind wings with red spot at base; outer rosy spot of submarginal series wanting. Abdomen with brown centre, flecked on each side with squamose creamy points, and terminating in two golden-yellow spots.

Expanse of wings 2 inches 8 lines.

Hab. Ega (*Bates*). B.M.

Allied to *P. leucophæa* of Walker.

Genus EUCYANE, Walker.

EUCYANE HYSTASPES, n. sp.

Wings above black, basal area brilliant metallic green; front wings with a narrow, central, oblique crimson band; apex white-tipped. Body brilliant metallic green; fringe white-flecked at apex and near anal angle; wings below nearly as above; the hind wings with two red points placed obliquely immediately beyond green area. Body—thorax brownish, legs streaked with white; abdomen with central scarlet band, surrounded with brown, and interrupted by whitish annulations.

Expanse of wings 2 inches 5 lines.

Hab. Venezuela (*Dyson*). B.M.

Allied to *E. glauca* of Cramer, from Surinam, but perfectly distinct. The nearest approach to the type form in the British Museum is an example from Ega, with red-tinted white band in front wings; but even in this example the band of hind wings is different in form and position.

Genus PHÆGORISTA.

PHÆGORISTA SIMILIS, Walker.

♂. Wings above crimson; front wings with apical area dark brown, a subapical fasciole, a spot near the anal angle, and the internervular fringes white. Hind wings with moderately broad dark-brown outer margin; fringe white-spotted. Thorax dark brown, white-streaked; antennæ dark brown; base of the abdomen orange, apex orange-tinted, central portion black, with white annulations. Below nearly as above.

Expanse of wings 2 inches 11 lines.

Hab. Fantee, Cape Coast (*Ussher*). Coll. Swanzy.

This is doubtless an imitation of *Atelis helcita* of Linnæus, which it closely resembles. The female is described by Mr. Walker.

Genus DIRPHIA*.

DIRPHIA VENATA, n. sp.

Wings above smoky brown; the internal area of front wings and the whole of the hind wings (excepting the margin) in male whitish brown; nervures blackish, especially in front wings; a large rounded black spot at end of hind-wing cell. Body above smoky brown; metathorax of male clothed with lighter hairs; antennæ ferruginous; wings below more uniform in colour, the markings scarcely defined. Body below dark smoky brown.

Expanse of wings: ♂ 4 inches, ♀ 4 inches 4 lines.

Hab. Buenos Ayres (*Burmeister*). B.M.

This handsome species is nearly allied to a female insect described by Mr. Walker as that sex of *Heliconisa impar*; its natural position in the genus is probably near *D. ursina*. I would propose for the female placed with *H. impar* the name of *Dirphia lancea*.

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* A third allied *Dirphia* has been characterized and figured by Blake (Proc. Ent. Soc. Philad. 1864) as a new genus and species under the name of *Coloradia pandora*.

6. Notes on the Types of *Tyrannula mexicana* of Kaup, and *Tyrannula barbirostris* of Swainson. By P. L. Sclater, M.A., Ph.D., F.R.S.

[Received January 13, 1871.]

Dr. Kaup's *Tyrannula mexicana*, shortly described in this Society's 'Proceedings' for 1851 (p. 51), has long been a stumbling-block to those engaged on American ornithology. I was originally inclined to believe it to be the same as *Myiarchus lawrencii* (see P. Z. S. 1856, p. 296, et Cat. A. B. p. 233). Prof. Baird has identified it with *M. cinerascens*, Lawrence (*cf.* B. N. A. p. 179); and his view has been usually followed by American naturalists.

Prof. Baird and Mr. Lawrence have both lately applied to me to clear up this point, and have supplied me with skins of the allied species for comparison with Kaup's type, which they believed to be in the Derby Museum, Liverpool. This, however, is not the case, as I ascertained last summer during the visit of the British Association to Liverpool. Indeed Kaup says (*l. s. c.*), "Mr. Wollweber sent me this species, which I also found in the British Museum." In the British Museum I ascertained that Kaup's type, if present, was not marked, and was accordingly forced as a last resource to apply to Dr. Kaup himself. Dr. Kaup, with his usual kindness, immediately forwarded to me the desired specimen from the Grand-Ducal Museum of Darmstadt, which I now exhibit.

Taking as a guide Prof. Baird's diagnosis of the difficult species of this group in his standard work on North-American Birds (p. 177), it will be seen at once, on examination of the typical specimen of *Tyrannula mexicana*, that it cannot be referred either to *Myiarchus mexicanus* (i. e. *M. cinerascens* of Lawrence) or to *M. lawrencii*, inasmuch as it has the "inner web of the tail-feathers broadly rufous to the extreme tip"—thus coming into Sect. A of the genus, which includes only *M. crinitus* and *M. cooperi*. Further comparison leads me to believe that the bird is really undistinguishable from *M. cooperi*, as here described by Baird. It is certainly rather smaller in dimensions than two of my skins of this species, and has the bill smaller. But a third specimen in my collection*, which I also refer to the (so-called) *M. cooperi* of Baird, agrees very well with it in general dimensions, and has the bill even slightly smaller. I do not, therefore, hesitate to decide that *Tyrannula mexicana* of Kaup is identical with *Myiarchus cooperi* of Baird†.

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* Obtained at Atlisco, in the State of Puebla, by Boucard.

† What *Tyrannula cooperi*, Kaup, is (which Prof. Baird believed to be this *Myiarchus*) does not now much signify. The original *Muscicapa cooperi* of Nuttall is certainly *Contopus borealis* (*vide* Baird, B. N. A. p. 188). But it is not to be supposed that Prof. Kaup would make two species of the same bird in the same paper. Therefore *Tyrannula cooperi* of Kaup is probably not *Myiarchus cooperi* of Baird.

This point being settled, the following changes must be made in the nomenclature of the four species of *Myiarchus* differentiated by Baird (B. N. A. p. 177):—

(1) *Myiarchus cooperi* of Baird must stand as *Myiarchus mexicanus* (Kaup), being, as just proved, *Tyrannula mexicana*, Kaup, P. Z. S. 1851, p. 51.

(2) *Myiarchus mexicanus* of Baird must stand as *Myiarchus cinerascens*, Lawrence.

A second obscure type among the Mexican Tyrannidæ that I have lately met with is *Tyrannula barbirostris* of Swainson, Phil. Mag. 1827, p. 367. The specimen upon which this species was founded is now in the Cambridge Museum, and is labelled in Swainson's own handwriting. It agrees exactly with *Blacicus tristis* (Gosse); Scl. Cat. A. B. p. 234—a well-known species of Tyrant-birds from Jamaica. There is no doubt, therefore, I think, that there has been an error in locality here, and that the species may be expunged from the Mexican list, whilst the Jamaican *Blacicus* must adopt the name *barbirostris* instead of the subsequently given term *tristis* of Gosse.

7. Remarks on some Species of *Dendrocolaptidæ* in the Collection of the Smithsonian Institution. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received January 13, 1871.]

In a series of skins of birds of the family Dendrocolaptidæ submitted to me for determination by the authorities of the Smithsonian Institution are several specimens of much interest, and concerning which I beg leave to offer a few remarks to the Society.

1. SYNALLAXIS CANDÆI.

Synallaxis candæi, Lafr. et D'Orb. Rev. Zool. 1838, p. 165; Bp. Consp. i. p. 213.

Castanea: pileo toto et capitis lateribus sordide nigris: mento et gulæ lateribus utrinque albis: gula media nigra: ventre medio albo: cauda castanea, recticibus decem, harum sex mediis nigricante late terminatis: long. tota 6, *alæ* 2·3, *caudæ rectr.* 3, *lat.* 1·2, *poll. Angl.*

Hab. Cartagena (*Candé*); Rio Hacha (*Delattre*, in Mus. Derb.); Savanilla (*Ashurst*).

I have previously seen examples of this rare and pretty *Synallaxis* only in the Derby and Berlin Museums. It appears to be restricted to the northern littoral of Columbia. Its nearest ally known to me is *S. kollari*, Pelzeln*, from the Rio Brancho, in which, however, the ear-coverts are not black, and the feathers in the middle of the throat are tipped with white.

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* Orn. Bras. p. 36.

The Smithsonian skin of this species is from Savanilla, collected by Mr. Ashurst.

2. ANABATES OCHROLÆMUS, Tschudi, Faun. Per. *Aves*, p. 240, tab. xx. fig. 2.

A typical specimen of this bird received by the Smithsonian Institution from Neuchâtel in exchange enables me to identify this species with *Anabates turdinus* of Natterer's MS. (Pelz. Orn. Bras. p. 41). It agrees very nearly with a Nattererian example in my own collection, and with a second specimen in the Smithsonian collection from the Huallaga. Mr. E. Bartlett obtained the same species on the Upper Ucayali (see Scl. et Salv. P. Z. S. 1866, p. 184).

This species must therefore now stand as *Philydor ochrolæmus* (Tsch.). I should remark that I have also one of Tschudi's original specimens of this species in my own collection (*Automolus ochrolæmus* of my C. A. B. p. 158), but had not previously recognized the identity of the two species.

3. ANABATES MONTANUS, Tsch. F. P. *Aves*, p. 240, tab. xx. fig. 1.

A typical example of this species acquired from the same source proves its identity with *Philydor striaticollis* of my American Catalogue. As the latter MS. name of Lafresnaye was only published by me in 1857, Tschudi again has priority, and the species must stand as *Philydor montanus*.

4. DENDROCOLAPTES CHUNCOTAMBO, Tsch. F. P. *Aves*, p. 241, tab. xxxii. fig. 1.

A typical specimen of this species is likewise in the Smithsonian collection. It is the same as *Dendrocolaptes ocellatus* of Spix (Av. Bras. i. p. 88). At least it agrees with the specimens now thus determined in my own collection, which are four in number, namely :—

a. Gualaquiza, Ecuador (*Fraser*) } =*D. palliata*, Scl. Cat. A. B.
b. R. Huallaga (*Hawxwell*) } p. 164.
c. Rio Negro (*Natt.*)=*D. ocellata* of Pelzeln, Orn. Bras. p. 45.
d. Xeberos (*Bartlett*).

Since I published my catalogue I have compared specimens *a*, *c*, and *d* with the marked types of *D. weddelli* * in the Paris Museum and found them identical with it, and not with *D. palliata*, as I had formerly supposed.

It is with great satisfaction, therefore, that I am able to say that Tschudi's ugly name is merely a useless synonym of *Dendrornis ocellata*.

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* Des Murs, in Castelnau's Voy. Ois. p. 46.

8. A List of Additional Species of Marine Mollusca to be included in the Fauna of Port Jackson and the adjacent Coasts of New South Wales. By George French Angas, F.L.S., F.R.G.S., C.M.Z.S., &c.

[Received January 11, 1871.]

In the year 1867 I published in these 'Proceedings'* a list of all the species of marine mollusks which up to that date had been ascertained by me to inhabit Port Jackson and the waters in its vicinity. Since then many additional forms have been obtained, a number of which were new to science and have lately been described; whilst others, though well known, had not hitherto been met with in the particular region towards which my researches have more especially been directed.

I am particularly indebted to Mr. John Brazier of Sydney for dredged specimens and *positive* information regarding the habitat of very many species; also to Dr. Cox of Sydney for notes on the localities of certain shells concerning which I had hitherto been in doubt.

As molluscan discoveries progress, many new species and even genera will doubtless be brought to light from so prolific a region; in the mean time I add the following list of 109 additional species, together with a few remarks on their characters, habits, and distribution, to form an appendix to my list of 1867.

Class GASTEROPODA.

Fam. TRITONIIDÆ.

1. TRITONIUM LABIOSUM.

Triton labiosus, Wood, Index Test. Supp. pl. 5. f. 18.

Tritonium rutilum, Menke, Moll. Nov. Holl.; Reeve, Conch. Icon. *Triton*, pl. 14. f. 52 *a*, *b*, *c*.

A small compact species, longitudinally ribbed, and transversely grooved, somewhat variable in form. Length about 10 lines.

Found alive on Shark Island, Port Jackson (*Brazier*).

2. TRITON (EPIDROMUS) BRAZIERI, Angas, P. Z. S. 1869, p. 46, pl. II. f. 3.

An elongately turreted shell with twelve varices. It is longitudinally ridged, and reticulated with irregular impressed striæ. There is a dark fascia on the middle of each whorl, and also a series of small spots at the lower edge of the fascia of the last whorl. Length 2 inches.

Lake Macquarie and Cape Solander, Botany Bay (*Brazier*).

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* "A List of Species of Marine Mollusca found in Port-Jackson Harbour &c." (Part I., P. Z. S., 1867, p. 185; Part II., P. Z. S. 1867, p. 912).

3. Triton (Cumia) speciosa, Angas, P. Z. S. 1871, Pl. I. f. 1.

A small beautifully sculptured white species, having upwards of twenty varices, and sometimes a pale chestnut band on the last whorl. It appears to belong to that group of the *Tritoniidæ* to which the subgeneric name of *Cumia* has been given, of which *Triton convolutus*, Brod., may be regarded as the type.

The largest specimen I have seen measures 8 lines. Mr. Brazier obtained it living at Green Point, Watson's Bay, Port Jackson.

4. Ranella pusilla, Brod. P. Z. S. 1832, p. 194.

This pretty little species, hitherto known from the tropical Pacific Islands, has been found at Broken Bay (*Brazier*).

Fam. Dactylidæ.

5. Amalda cingulata.

Ancillaria cingulata, Sow. Species Conch. pl. 6. f. 36, 37.

Several specimens of this beautiful shell have been met with at Brisbane Water and Broken Bay. It varies in length from 3 to 4½ inches.

The animal, Dr. Cox informs me, is 10 inches in diameter.

6. Olivella exquisita, Angas, P. Z. S. 1871, Pl. I. f. 2.

A charming little species, with three rows of chestnut spots connected by fine undulating lines.

Coodgee Bay, New South Wales (*Brazier*).

Fam. Volutidæ.

7. Voluta fusiformis, Swains.; Reeve, Conch. Icon. *Voluta*, pl. 3. f. 6.

A broken example of this fine Volute has been found on the beach at Broken Bay—probably its northernmost range. It was hitherto regarded as exclusively Tasmanian.

8. Voluta punctata, Swainson, Zool. Illus. 1st series, pl. 161; Reeve, Conch. Icon. *Voluta*, pl. 21. f. 52.

The very bad figure given in Reeve, taken from an immature and much worn specimen in the British Museum, gives but a faint idea of this rare shell. Its locality was unknown until very recently, when several examples were obtained by Mr. Brazier from the outer beach at Broken Bay.

9. Voluta zebra, Leach, Zool. Miscell. vol. i. pl. 12. f. 1.

Port Stephen Heads.

The more elongated and closely lined variety, described by Leach as *V. lineata*, has been found by Mr. Brazier on the beach at Lake Macquarie.

10. **Voluta nucleus**, Lam. Anim. sans Vert. vol. x. p. 405; Reeve, Conch. Icon. *Voluta*, pl. 18. f. 41.

Newcastle, New South Wales (*Brazier*).

Fam. Mitridæ.

11. **Mitra glabra**, Swains. Exotic Conch. pl. 24.

Botany Bay. Occurs also in South and Western Australia.

12. **Mitra variabilis**, Reeve, P. Z. S. 1844, p. 175.

A species of a brownish-olive colour, with a zone of interrupted grey markings near the middle of the last whorl, and a few irregular flakes of the same colour descending from the sutures. The whorls are more or less encircled by finely punctured striæ. Length 1½ inch.

Under stones at Double Bay (Port Jackson) and Brisbane Water (*Brazier*).

The shells under the above name in the Cumingian Collection in the British Museum are identical with *M. cylindrica*. I cannot find Reeve's original type; but the specimens sent me by Mr. Brazier agree with his description of *M. variabilis*.

Subfam. Columbellinæ.

13. **Columbella interrupta**, Angas, P. Z. S. 1865, pl. 11. f. 9, 10.

This beautiful little species may be known by its two green finely pencilled and scalloped bands.

The type specimen was dredged by me at Yorke's Peninsula, in South Australia. Mr. Brazier has recently obtained it in Port Jackson.

14. **Columbella (Mitrella) bicincta**, Angas, P. Z. S. 1871, Pl. I. f. 3.

A smooth fusiform species, distinguished by having two opaque white bands articulated with brown above and below the sutural margin.

Dredged in Watson's Bay, Port Jackson.

15. **Columbella (Mitrella) attenuata**, Angas, P. Z. S. 1871, Pl. I. f. 4.

An elegant little species, remarkable for its very elongated form, and its simple bands of light and dark brown.

Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

16. **Columbella (Anachis) atrata**, Gould, Otia, p. 131.

In my "List of Port-Jackson Shells" (Part I. No. 55) I erroneously gave the name *C. lentiginosa*, Hinds, to this species, which is a very distinct shell, and comes from the Gulf of Nicoya. *C. lentiginosa* must be cancelled as an Australian species.

C. atrata is found under stones at Mossman's Bay, Port Jackson.

Fam. MARGINELLIDÆ.

17. **MARGINELLA (GLABELLA) OCHRACEA**, Angas, P. Z. S. 1871, Pl. I. f. 6.

A minute triangularly ovate species, of a yellowish colour, with the apex of the spire very obtuse.

From shell-sand, coast of New South Wales (*Brazier*).

18. **HYALINA (VOLVARINA) MUSTELINA**, Angas, P. Z. S. 1871, Pl. I. f. 5.

Elongately ovate, banded with grey and brown, and with the outer lip finely dentate within.

Dredged off the "Sow and Pigs," Port Jackson (*Brazier*).

Fam. NATICIDÆ.

19. **NATICA AREOLATA**, Récluz, P. Z. S. 1843, p. 206.

Painted with finely waved fawn-coloured lines and arrow-headed bands, and sometimes with a row of chestnut spots on a white sutural band, and a second near the base of the last whorl.

Dredged at the "Sow and Pigs," Port Jackson.

20. **NATICA (LUNATIA) INCEI**, Philippi, MS. Mus. Cuming (Brit. Mus.); Reeve, Conch. Icon. *Natica*, pl. 20. f. 89.

Brisbane Water (*Brazier*).

21. **NATICA (NEVERITA) CONICA**, Lam. Anim. sans Vert. viii. p. 632; Reeve, Conch. Icon. *Natica*, pl. 12. f. 48.

On the sand-spit at Middle Harbour, Port Jackson.

This is a very abundant species in South Australia.

Fam. SCALIDÆ.

22. **CROSSEA CONCINNA**, Angas, P. Z. S. 1867, pl. XLIV. f. 14.

The genus *Crossea* was founded by Mr. Arthur Adams for the reception of two species from Japan. He remarks of these singular and beautiful little shells, "they have perhaps the closest affinity with *Cirsotrema* (Mörch), a genus of *Scalidæ*. They also remind one of *Torinia* and *Conradia*. A great peculiarity consists in the canaliculate angular projection at the fore part of the aperture."

Dredged by Mr. Brazier near the "Sow and Pigs" reef, in Port Jackson, at a depth of from 2 to 4 fathoms.

23. **SCALA (CIRSOTREMA) MÖRCHI**, Angas, P. Z. S. 1871, Pl. I. f. 7.

Decussated with longitudinal ribs, and more numerous transverse ridges; the former evanescent at the base.

Dredged near the "Sow and Pigs" (*Brazier*).

Fam. PYRAMIDELLIDÆ.

24. CINGULINA SPINA.

Turritella spina, Crosse et Fisch. Journal de Conch. 1864, p. 347; 1865, p. 44, pl. 3. f. 13, 14.

Dredged at "Sow and Pigs" reef (*Brazier*).

25. MATHILDA ELEGANTULA, Angas, P. Z. S. 1871, Pl. I. f. 8.

An acuminate semitransparent shell with fourteen whorls, each having three rounded transverse ribs, the interstices finely longitudinally striated.

Dredged in Lane Cove, Port Jackson (*Brazier*).

26. AGATHA AUSTRALIS, Angas, P. Z. S. 1871, Pl. I. f. 9.

An opaque white shell, with an acuminate spire and eight whorls, having the columella furnished with a strong spiral plait.

Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

27. ODOSTOMIA SIMPLEX, Angas, P. Z. S. 1871, Pl. I. f. 10.

A very small white shell, with a sharp transverse columellar plait, and the outer lip elevately striated within.

Port Jackson (*Brazier*).

28. SYRNOLA TINCTA, Angas, P. Z. S. 1871, Pl. I. f. 11.

A small, subulate, smooth, shining shell, irregularly banded and marked with brown, having a single prominent columellar plait.

"Sow and Pigs" (*Brazier*).

Fam. EULIMELLIDÆ.

29. LEIOSTRACA LESBIA, Angas, P. Z. S. 1871, Pl. I. f. 14.

A very slender, white, shining species, with a semiopaque band below the suture. Larger and more solid than *L. acutissima*.

"Sow and Pigs" (*Brazier*).

Fam. CERITHIOPSIDÆ.

30. CERITHIOPSIS CLATHRATA, Angas, P. Z. S. 1871, Pl. I. f. 12.

A beautifully sculptured little species.

Dredged near the "Sow and Pigs" (*Brazier*).

31. CERITHIOPSIS CROCEA, Angas, P. Z. S. 1871, Pl. I. f. 13.

Of an orange colour, with four ribs on each whorl, the intercostal spaces finely longitudinally striated.

Dredged off Camp Cove, Port Jackson (*Brazier*).

32. TRIFORIS GRANULATUS, Ad. et Reeve, Voy. Samarang, pl. 11. f. 5.

A small brown shell, with three strongly granulated ribs on each whorl.

Botany Bay.

Fam. ARCHITECTONIDÆ.

33. TORINIA STRAMINEA, Lam.; Chem. Conch. v. pl. 172. f. 1699.

Broken Bay (*Brazier*).

34. PHILIPPIA HYBRIDA.

Solarium hybridum, Lam. Encyc. Méth. pl. 446. f. 5, 6.

White, ornamented with broad pale-brown flames.

Lake-Macquarie beach, New South Wales (*Brazier*).

35. PHILIPPIA LAYARDI, A. Ad. P. Z. S. 1854, p. 317.

Flatter and more keeled than the preceding species, with the ground-colour rich brown, ornamented with white on the keel and round the umbilicus.

Lake-Macquarie beach (*Brazier*).

Fam. TEREBRIDÆ.

36. TEREBRA (HASTULA) BRAZIERI, Angas, P. Z. S. 1871, Pl. I. f. 15.

This pretty species has the whorls obsoletely plicate and shining, and is irregularly painted with longitudinal orange flammæ. Length 13 lines.

Obtained at Brisbane Water by Mr. Brazier.

Fam. TURRITIDÆ.

37. PLEUROTOMA VIOLACEA, Hinds, Moll. Voy. Sulphur, pl. 5. f. 8.

A pale variety of this species occurs at Broken Bay (*Brazier*).

38. CLATHURELLA HAYESIANA, Angas, P. Z. S. 1871, Pl. I. f. 17.

A very beautiful species of a chalky-grey colour, and deep purple within; closely longitudinally ribbed, and transversely ridged throughout.

Dredged in Lane Cove, Port Jackson (*Brazier*).

39. CLATHURELLA TENUILIRATA, Angas, P. Z. S. 1871, Pl. I. f. 18.

Longitudinally ribbed and crossed with narrow, distant, erect ridges, the interstices of which are ornamented with very fine concentric striæ.

Dredged off Goat Island, Port Jackson, in 5 fathoms (*Brazier*).

40. CLATHURELLA SCULPTILIS, Angas, P. Z. S. 1871, Pl. I. f. 19.

This species is elaborately sculptured with strong longitudinal ribs alternating with fine erect striæ, and crossed by concentric somewhat nodulous ridges.

Dredged off the "Sow and Pigs" (*Brazier*).

41. Clathurella bicolor, Angas, P. Z. S. 1871, Pl. I. f. 20.

Of a pale ash-colour, with the base of the last whorl chocolate-brown.

"Sow and Pigs" (*Brazier*).

42. Clathurella bilineata, Angas, P. Z. S. 1871, Pl. I. f. 23.

A small ovate straw-coloured species, white at the aperture, with two narrow brown bands on the last whorl.

Dredged near the "Sow and Pigs" (*Brazier*).

43. Clathurella albocincta, Angas, P. Z. S. 1871, Pl. I. f. 22.

Ovately fusiform, with the last whorl stained with brown, having an opaque white band in the centre.

Dredged near the "Sow and Pigs" (*Brazier*).

44. Clathurella brazieri, Angas, P. Z. S. 1871, Pl. I. f. 21.

Narrowly elongately turreted, pale brown, darker on the lower whorl and at the apex, and with the channel sharply recurved.

Dredged near the "Sow and Pigs" (*Brazier*).

Fam. Conidæ.

45. Conus aplustre, Reeve, Conch. Icon. *Conus*, pl. 30. f. 170.

The figure of this Cone is so bad in Reeve's work as to be scarcely recognizable. The shell is of a light yellowish chestnut, profusely filleted with markings of a darker colour, and with a pale band round the middle of the last whorl. It averages 1 inch in length.

"Bungaree Nora," Broken Bay; Lake Macquarie; Cape Solander, Botany Bay; also from Port Fairy, Bass's Straits (*Brazier*).

46. Conus cooki, Brazier, P. Z. S. 1870, p. 109.

A species 10 lines long, marked with reddish, undulating, longitudinal lines, and somewhat resembling a small non-coronated specimen of the *C. princeps* from Gulf of California. Mr. Brazier found this new Cone amongst the rocks at the spot where Capt. Cook landed at Botany Bay.

47. Conus rossiteri, Brazier, P. Z. S. 1870, p. 109.

Mr. Brazier says of this shell that it is allied to *C. gilvus* of Reeve. I have never seen the specimen; but, from his description, I take it to be in an immature state.

Cape Solander, Botany Bay.

48. Conus rutilus, Menke, Moll. Nov. Holl. p. 57. no. 133.

This pretty little Cone varies in colour from brown to orange, red or purple, and is occasionally freckled with lines and spots. In the South-Australian gulfs I met with it frequently. Mr. Brazier obtained five specimens at Cape Solander, Botany Bay.

Fam. CYPRÆIDÆ.

49. CYPRÆA CAURICA, Linn.; Lister, Conch. pl. 677. f. 24.

Cape Banks, Botany Bay; Broken Bay (*Brazier*).

50. CYPRÆA ANNULUS, Linn. Encycl. Méth. pl. 356. f. 7.

Vaucluse Bay, Port Jackson (*Brazier*).

51. CYPRÆA FIMBRIATA, Gmel.; Wood, Ind. Test. pl. 17. f. 26.

Cape Banks, Botany Bay (*Brazier*).

52. CYPRÆA LUTEA, Gronovius, Zoophylacium, pl. 19. f. 17.

C. humphreysi, Gray.
C. commixta, Wood.

Lake Macquarie beach (*Brazier*).

53. CYPRÆA STAPHYLÆA, Linn.; Lister, Conch. pl. 708. f. 58.

Broken Bay (*Brazier*).

54. CYPRÆA EROSA, Linn.; Lister, Conch. pl. 692. f. 39.

Broken Bay (*Brazier*).

55. CYPRÆA TABESCENS, Gray; Sow. Conch. Illus. f. 14.

Lake-Macquarie beach (*Brazier*).

56. CYPRÆA SCURRA, Chemn. Conch. x. p. 103, pl. 144. f. 1338.

Broken Bay (*Brazier*).

57. CYPRÆA FLAVEOLA, Linn.; Sow. Conch. Illus. f. 11.

The specimens I have seen from the localities recorded beneath I consider to represent the true *C. flaveola* of Linnæus; they differ both from *C. spurca* and *C. gangrænosa*.

Lake Macquarie; Broken Bay; Botany Bay (*Brazier*).

58. TRIVIA CANDIDULA, Gaskoin; Sow. Conch. Illus. f. 149.

"Bottle and Glass" Point, Port Jackson (*Brazier*).

59. TRIVIA GLOBOSA, Gray; Sow. Conch. Illus. f. 34.

Little Bay (*Brazier*).

60. TRIVIA INSECTA, Mighels; Sow. in Thesaurus (*Cypræa*), pl. 46. f. 477, 478, 479.

Little Bay (*Brazier*).

Fam. AMPHIPERASIDÆ.

61. AMPHIPERAS BULLA.

Ovulum bulla, Ad. & Reeve, Voy. Samarang, pl. 6. f. 5.

Port Stephen, New South Wales; also Japan.

62. AMPHIPERAS BREVIS.

Ovulum breve, Sow. Spec. Conch. f. 26, 27.

Port Stephen, New South Wales.

Fam. CERITHIIDÆ.

63. CERITHIUM RHODOSTOMA, A. Ad.; Sow. in Thesaurus, vol. ii. pl. 180. f. 103.

A very pretty species, beautifully sculptured, of a pearly brown colour, the columella rose-coloured.

Lake Macquarie, and "Sow and Pigs," Port Jackson. Mr. Adams's type is from Tasmania.

Fam. LITTORINIDÆ.

64. LITTORINA SCABRA.

Helix scabra, Linn. Syst. Nat. p. 1242; Reeve, Conch. Icon. pl. 5. f. 21.

A very abundant species, widely distributed throughout the Indo-Pacific tropical regions. Found by Mr. Brazier attached to the trunks of mangroves in Port Jackson.

65. FOSSARINA BRAZIERI, Angas, P. Z. S. 1871, Pl. I. f. 24.

A smaller species than *F. patula*, A. Ad. & Ang., rounder in form, of a different sculpture, and more or less variegated with dark brown.

Fam. RISSOIDÆ.

66. RISSOINA CRASSA, Angas, P. Z. S. 1871, Pl. I. f. 16.

A solid species, strongly longitudinally ribbed, the ribs terminating in nodules at the base of the last whorl.

"Bottle and Glass" rocks, Port Jackson (*Brazier*).

Fam. NERITIDÆ.

67. NERITA ALBICELLA, Linnæus; Quoy, Voy. de l'Astrolabe, iii. pl. 65. f. 17, 18.

Common throughout tropical Australia and the Indo-Pacific province generally.

Rose Bay, Port Jackson (*Brazier*).

68. NERITINA (VITTA) RANGIANA, Récluz, Rev. Zool. 1841.

N. viridis, var. *major*, Rang.

Differs from *N. viridis*, Linn., in the angularity of the last whorl, and in being of a different shade of green, painted with several rows of interrupted dark lines.

Dredged in Port-Jackson Harbour.

69. Neritina (Vitta) pulcherrima, Angas, P. Z. S. 1871, Pl. I. f. 25.

An elegant little shell, more rounded than *N. viridis*, Linn., and easily distinguished by its yellow bands and dark purple waved lines.

Dredged near "Sow and Pigs" reef, Port Jackson.

Fam. Trochidæ.

70. Turbo imperialis, Gmelin, Syst. Nat. p. 3594; Reeve, Conch. Icon. *Turbo*, pl. 2. f. 6.

Although I have frequently met with this fine large species about Moreton Bay and northwards, I never obtained it during my researches in New South Wales. Dr. Cox, however, assures me that he found a living specimen amongst the rocks at Watson's Bay, Port Jackson; and on that gentleman's undoubted authority I now include the species in my list.

71. Liotia speciosa, Angas, P. Z. S. 1871, Pl. I. f. 26.

A charming little species, quite distinct from *L. angasi*, Crosse, in sculpture and general character.

Under stones at Double Bay, Port Jackson (*Brazier*).

72. Liotia clathrata, Reeve, P. Z. S. 1843; Conch, Icon. *Delphinula*, pl. 5. f. 21 *a* & *b*.

An elegant species, larger than the preceding, strongly clathrate, and somewhat resembling *L. pulcherrima* of A. Ad.

Dredged at "Sow and Pigs" bank (*Brazier*); Philippines (*Cuming*).

73. Zizyphinus comptus, A. Ad. P. Z. S. 1854, p. 38; Reeve, Conch. Icon. *Zizyphinus*, pl. 7. f. 48.

A small, conical, pale fawn-coloured, nodulosely granulated species, with a few brown spots at the periphery of the whorl.

Shark Island, Port Jackson, under stones at low water (*Brazier*); also New Caledonia.

74. Clanculus nodoliratus, A. Ad. P. Z. S. 1851, p. 163.

Shark Bay, Port Jackson, New South Wales.

75. Minolia pulcherrima, Angas, P. Z. S. 1869, pl. ii. f. 10.

A finely sculptured species, beautifully stained with bright rose-colour, and spotted on the keels with dark purple-lake.

Brisbane Water, New South Wales (*Brazier*).

76. Minolia bellula, Angas, P. Z. S. 1869, pl. ii. f. 11.

Another very lovely species, shining, and conical, of a pale straw-colour, with close-set serpentine rose-coloured flames on each whorl, abruptly ceasing at the periphery of the last whorl.

Brisbane Water, New South Wales (*Brazier*).

Fam. HALIOTIDÆ.

77. HALIOTIS (PADOLLUS) BRAZIERI, Angas, P. Z. S. 1869, pl. 11. f. 1.

Richly mottled with red and green blotches, and remarkable for its *radiate* sculpture, and large, erect, elevated perforations.

Lake Macquarie, New South Wales (*Brazier*); Watson's Bay, Port Jackson (*Angas*).

78. HALIOTIS HARGREAVESI, Cox, P. Z. S. 1869, p. 49, pl. 26. f. 4.

Strongly longitudinally ribbed with nine or ten flat and coarsely lamellose ribs, and with depressions in the internal surface corresponding with the elevations without.

Broken Bay Heads, New South Wales.

Fam. FISSURELLIDÆ.

79. EMARGINULA DILECTA, A. Ad. P. Z. S. 1851, p. 85; Thesaurus (*Fissurellidæ*), pl. 10. f. 5.

A small, coarsely latticed, elongated, and somewhat depressed species, with the marginal slit long and narrow.

Lane Cove, Port Jackson (*Brazier*).

Fam. SCUTELLIDÆ.

80. SCUTELLINA CINNAMOMEA.

Patella cinnamomea, Gould, Expedition, Shells, p. 9.
Scutellina ferruginea, A. Ad.

A thin, finely sculptured species, of a brown colour.

Fam. DENTALIIDÆ.

81. CADULUS ACUMINATUS, Deshayes, in Cum. Coll.

Dredged on a clear sandy bottom, Middle Harbour, Port Jackson.

The shell of *Cadulus* is a small, semitransparent, curved tube, more or less tumid below and contracted at the base. It was at one time supposed to be the case of an annelid; but, from an examination of the animal, it has been proved to be a mollusk.

Fam. CHITONIDÆ.

82. LORICA ANGASI, H. Ad. P. Z. S. 1864, p. 193.

Camp Cove, Port Jackson (*Brazier*).

A species quite distinct from *L. cimolia*, Reeve, of which *L. volvox*, Reeve, is a synonym.

Fam. ACTEONIDÆ.

83. BUCCINULUS NIVEUS, Angas, P. Z. S. 1871, Pl. I. f. 27.

A somewhat acuminate species of an ivory white throughout.

Dredged at the "Sow and Pigs," Port Jackson (*Brazier*).

84. MYONIA SPECIOSA.

Monoptygma speciosa, A. Ad. in Sow. Thes. Conch. pl. 172. f. 24, 25.

A very beautiful thin species, of a pale horn-colour, with the spiral ridges of the whorls deeply punctured.

Lane Cove, Port Jackson; dredged in 3 fathoms in sandy mud (*Brazier*).

85. RINGICULA CARON, Hinds, P. Z. S. 1844, Voy. Sulphur, p. 47, pl. 16. f. 15, 16.

In this species the spire is lengthened and exserted, the last whorl is rounded, the shell is closely grooved throughout, with striæ at regular intervals, and the edge of the outer lip is slightly corrugated.

Goat Island, Port Jackson; dredged in 10 fathoms, mud (*Brazier*); Straits of Malacca (*Hinds*).

86. RINGICULA DENTICULATA, Gould, Otia, p. 121.

The numerous striæ (finer ones intervening), *denticulate* labium, and scantiness of callus about the siphonal notch mark this species.

Port Jackson (*Gould*).

87. RINGICULA EXSERTA, Hinds, P. Z. S. 1844, p. 97.

Smaller and more elongated than *R. caron*, with the spire exserted, shining, and nearly smooth.

Dredged near the "Sow and Pigs," Port Jackson (*Brazier*); Philippines (*Hinds*).

88. RINGICULA ARCTATA, Gould, Otia, p. 122.

In this species the aperture is auricular, the outer lip very much thickened, and the whorls finely, distantly striated at the lower part.

Goat Island, Port Jackson (*Brazier*); Hong-Kong harbour (*Gould*).

Fam. BULLIDÆ.

89. BULLA (HAMINEA) TENERA, A. Ad. Thesaurus Conch. *Bullidæ*, p. 583, pl. 124. f. 103.

A small, pellucid, yellowish horn-coloured species, with very minute, close-set transverse lines when seen through the lens.

Sand Spit, Middle Harbour, Port Jackson, on seaweed (*Brazier*).

Fam. LOPHOCERCIDÆ.

90. CYLINDROBULLA FISCHERI, A. Ad. & Angas, P. Z. S. 1864, p. 37.

Lane-Cove River, Port Jackson, in mud (*Brazier*).

Fam. APLYSIIDÆ.

91. DOLABRIFERA BRAZIERI, Sow. P. Z. S. 1870, p. 250.

Taken at the "Bottle and Glass" rocks, Port Jackson (*Brazier*).

The shell of this species is $\frac{3}{4}$ of an inch in length, being three times as large as *D. pacifica*, Pease.

Class PTEROPODA.

Fam. Spirialidæ.

92. Heterofusus bulimoides.

Limacina bulimoides, D'Orbigny, Voy. Am. Mérid. pl. 12. f. 36–38.

Cook's River, Botany Bay (*Brazier*).

Class CONCHIFERA.

Fam. Pholadidæ.

93. Barnea similis.

Pholas similis, Gray, MS. Brit. Mus.; Thesaurus Conch. pl. 103. f. 12–14.

"Bottle and Glass" rocks, in sandstone (*Brazier*).

Fam. Corbulidæ.

94. Corbula venusta, Angas, P. Z. S. 1871, Pl. I. f. 29.

Stouter than *C. zelandica*, with a cornelian-coloured ray at the umbones. Dredged on the "Sow and Pigs" bank, Port Jackson.

95. Cryptomya elliptica.

Sphænia elliptica, A. Ad. P. Z. S. 1850, p. 88.

A transverse, oval, white shell, with the posterior side radiately sulcated, and the hinge of *Mya*.

Lane Cove, Port Jackson; in sandy mud, 3 fathoms (*Brazier*), 4 fathoms, mud (*F. Strange*).

Fam. Anatinidæ.

96. Thracia speciosa, Angas, P. Z. S. 1869, pl. ii. f. 12.

An elegant elongated species, with the space beyond the umbonal ridge strongly granulated.

Port Jackson; dredged off the "Sow and Pigs" reef in 4 fathoms water (*Brazier*).

97. Neæra (Leptomya) pura, Angas, P. Z. S. 1871, Pl. I. f. 30.

A thin, subovate shell, sculptured with rather distant, fine, concentric, raised lines, and having the posterior side obliquely truncate.

Lane Cove, Port Jackson; in sandy mud (*Brazier*).

Mr. A. Adams refers *Leptomya* to the family *Tellinidæ*, and considers it nearly allied to *Scrobicularia*.

Fam. MACTRIDÆ.

98. **MACTRA (SPISULA) FLUVIATILIS**, Angas, P. Z. S. 1871, Pl. I. f. 31.

A small species of a dusky white or pale olive-colour, having externally somewhat the aspect of an *Azara*.

Dredged in the Hawkesbury river, New South Wales; in brackish water at 2 fathoms.

Subfam. LUTRARIINÆ.

99. **MEROPE ÆGYPTIACA.**

Lutraria ægyptiaca, Gray, Wood's Index Test. pl. 6. f. 34.

Lake Macquarie, New South Wales.

Fam. TELLINIDÆ.

100. **TELLINA (PERONÆODERMA) ALBINELLA**, Lam. Anim. sans Vert. vi. p. 194.

Broken Bay, rose-coloured var. (*Brazier*).

This fine species, though rare in New South Wales, is extremely abundant on the sandy beaches of Encounter Bay in South Australia.

101. **TELLINA (ANGULUS) BRAZIERI**, Sow. in Reeve, Conch. Icon. *Tellina*.

Dredged at "Sow and Pigs" bank in Port Jackson (*Brazier*).

A small, thin species, of a delicate pink colour.

Fam. CHAMIDÆ.

102. **CHAMA REFLEXA**, Reeve, Conch. Icon. *Chama*, f. 16.

Lane Cove (*Brazier*); Middle Harbour, Port Jackson (*Rev. R. L. King*).

In young specimens from sheltered localities the spines of this variable species become quite long and spout-shaped, like those of *Spondylus*, whilst in exposed situations they are comparatively short.

Fam. ASTARTIDÆ.

103. **CRASSATELLA FULVIDA**, Angas, P. Z. S. 1871, Pl. I. f. 32.

A small subtriangularly ovate and rather compressed species, concentrically strongly ribbed, and faintly streaked and clouded with pale orange on a yellowish ground.

Dredged near "Sow and Pigs" bank, Port Jackson (*Brazier*).

104. **CARDITA AMABILIS**, Desh. P. Z. S. 1852, p. 102, pl. XVII. f. 8, 9.

Dredged in Port Jackson (*Brazier*); also from Moreton Bay.

A pretty little species, with nodosely crenate radiating ribs, freckled here and there with reddish spots.

Fam. MYTILIDÆ.

105. CRENELLA (MODIOLARIA) CUMINGIANA.

Modiola cumingiana, Dunker; Reeve, Conch. Icon. *Modiola*, pl. 9. f. 63 *a, b*.

Lake Macquarie, New South Wales (*Brazier*); also Moreton Bay and St. Vincent's Gulf.

106. PERNA CONFUSA, Angas, P. Z. S. 1871, Pl. I. f. 33.

Of a dark olive-brown colour, paler beneath; somewhat like *Modiola fortunei*, Dunker (from China), but more arcuate in form, of a different colour, and four times as large.

Lane-Cove River, Port Jackson.

Fam. ARCIDÆ.

107. LIMOPSIS BRAZIERI, Angas, P. Z. S. 1871, Pl. I. f. 34.

A small somewhat triangularly ovate species, finely concentrically ridged, and longitudinally crenate.

Dredged near the "Sow and Pigs," Port Jackson (*Brazier*).

Fam. RADULIDÆ.

108. RADULA (MANTELLUM) ORIENTALIS.

Lima orientalis, Ad. & Reeve, Voy. Samarang, pl. 11. f. 33 *a, b*.

A thin, delicate, semipellucid species, that must not be confounded with *R. angulata*, Sow.

Dredged near Watson's Bay (*Brazier*).

Class BRACHIOPODA.

Fam. TEREBRATULIDÆ.

109. TEREBRATELLA SANGUINEA, Lam. Anim. sans Vert. vii. p. 331.

A small yellowish species, handsomely ornamented with red markings.

Dredged near the rocks at Camp Cove, Port Jackson, in 7 fathoms (*Brazier*).

February 7, 1871.

G. R. Waterhouse, Esq., V.P., in the Chair.

The following report on the additions to the Society's Menagerie during the month of January 1871 was read:—

The total number of registered additions to the Society's Menagerie during the month of January 1871 was 38, of which 17 were by presentation, 15 by purchase, and 3 by exchange, 3 animals having been received only on deposit. The total number of departures during the same period, by death and removals, was 82.

The following were the most noticeable amongst the additions:—

1. A second living specimen of the Kakapo, or Ground-parrot of New Zealand (*Strigops habroptilus*), deposited January 24th by the captain of the vessel in which it was brought over, until it could be ascertained for whom it is really destined. I have reason to believe it is intended for this Society, but that the letter announcing its arrival has miscarried.

2. Two Derbyan Screamers (*Chauna derbiana*), imported from Santa Martha by one of the Royal Mail Steampacket Company's vessels, and received January 29th. These birds are, no doubt, from the same district as those formerly obtained for the Society by Mr. Greey (*cf.* P. Z. S. 1864, p. 74, and 1866, pp. 368, 369).

3. An Annulated Snake (*Leptodira annulata*) from Panama, purchased on the same day. This is a well-known Central-American species, but has not been previously exhibited alive in the Society's Menagerie.

4. A pair of the Splendid Grass-Parrakeet (*Euphema splendida*, Gould, B. of Austr. v. pl. 42). These are, I believe, the first examples of this beautiful Grass-Parrakeet ever brought alive to this country. We purchased them on January 30th from a London dealer, who states that they were received from a vessel coming from Adelaide. Mr. Gould (Handb. B. of Austr. ii. p. 79) has already spoken of the occurrence of this species in South Australia.

Mr. E. Ward, F.Z.S., exhibited a skin of white variety of the Tiger (*Felis tigris*), obtained from an animal killed in the Mirzapore district, North-west Provinces of India.

Mr. W. B. Tegetmeier, F.Z.S., exhibited a specimen of an Eel of a variety believed to be new to the fauna of Great Britain. It had been obtained from fresh water in the Scilly Islands, and had been referred by Dr. Günther to the Pimperneau of Cuvier (*Anguilla cuvieri*, Kaup).

Mr. J. E. Harting, F.Z.S., exhibited a specimen of the Red-breasted Goose (*Anser ruficollis*, Pallas), recently shot at Maldon, on the Essex coast.

Mr. H. E. Dresser exhibited specimens of the eggs of some European birds (hitherto unknown), and made the following remarks on them:—

"Amongst some eggs which I have lately received from Dr. Krüper and from Dr. Dybowsky, through M. Jules Verreaux, are some of considerable interest to collectors; and I have therefore brought them here for inspection. They belong to the following species, viz.:—

Micronisus brevipes.
Motacilla citreola.
Turdus fuscatus.
Reguloides superciliosus.
Ruticilla aurorea.

At the same time I beg leave to offer the following remarks respecting them.

"MICRONISUS BREVIPES.

"It is not long ago that the eggs of this Sparrow-hawk were first made known through Dr. Krüper, who procured them near Smyrna. The learned Doctor stated then that, as many of these Sparrow-hawks appeared to pass onwards into Europe, he felt sure that the species would be found to breed in Turkey or in Russia; and such proved to be the case, as Mr. W. Schluter of Halle subsequently procured both birds and eggs from Mr. Hodek, who took them near the Tiniok river, on the Servio-Bulgarian frontier, near Piconica in Servia. These eggs and birds were exhibited by Mr. Schluter, who also wrote an article respecting them in the 'Zoologischer Garten,' p. 375 (1869).

"Since then Dr. Krüper, who has been collecting in Greece, has brought back several sittings of the eggs of this bird collected by him in that country, one of which, consisting of three eggs, I am enabled to exhibit. These eggs were taken by Dr. Krüper at Olympus, on the 12th of June last (1870); but I regret to say that I have not yet received from him any particulars as to the position of the nest, &c. In size they measure $1\frac{11}{20}$ by $1\frac{5}{20}$ inch, and in appearance are not unlike the eggs of the Hen-Harrier (*Cercus cyaneus*), but differ in having the pores deeper and further apart, and also in being of a more intense green colour in the inside.

"I have also the pleasure to exhibit two skins of this rare Hawk, procured by Dr. Krüper in Greece—the one adult, and the other immature.

"REGULOIDES SUPERCILIOSUS.

"These eggs are of considerable interest, as the bird is an occasional straggler to Europe, and has also been procured in England. The Indian collectors, and Mr. A. O. Hume in particular, have long endeavoured in vain to procure them. I have also lately received a letter from Mr. Brooks of Etawah, in which he says that he hopes ere long to be in possession of genuine eggs of this rare bird; and, curiously enough, he appears to think that they may prove to be (as is actually the case) pure white and unspotted. Mr. A. O. Hume writes from Simla, under date of 24th June last (*vide* Ibis, 1870, p. 530), that the eggs of this bird were brought to him by a native collector from Chimbla with the parent bird. He writes respecting them as follows:—'The ground-colour is a very delicate greenish white; and they are thinly speckled and spotted, chiefly towards the large end, with a sort of burnt-umber brown, which in some spots is almost black, and in others excessively diluted and pale. The eggs have scarcely any gloss. They vary from ·68 to ·7 inch in length, and from ·54 to ·55 in breadth. They were procured on the 24th May, 1870. Of course, after all, these eggs may not be genuine; but there are *prima facie* strong grounds for believing them to be so.'

"From the above it will be seen that the eggs brought to Mr. Hume were spotted, and are therefore, I should say, not genuine.

"The eggs which I now exhibit are, as will be seen, pure white, unspotted, and rather glossy. In size they measure $\frac{12}{20}$ inch in length, by $\frac{9}{20}$ in width, and are almost pear-shaped, falling to a blunt point at the smaller end.

"These eggs were collected in Darasim, Dauria, by Dr. Dybowsky, and sent along with the birds, which were marked *Phyllopneuste coronata*; but on comparing them with specimens of *Reguloides superciliosus* from Siberia and India, I find them to belong to the latter species. I beg leave to offer for comparison one of the skins sent by Dr. Dybowsky and a specimen of *R. superciliosus* received from Mr. Brooks of Etawah, North-western India.

"TURDUS FUSCATUS.

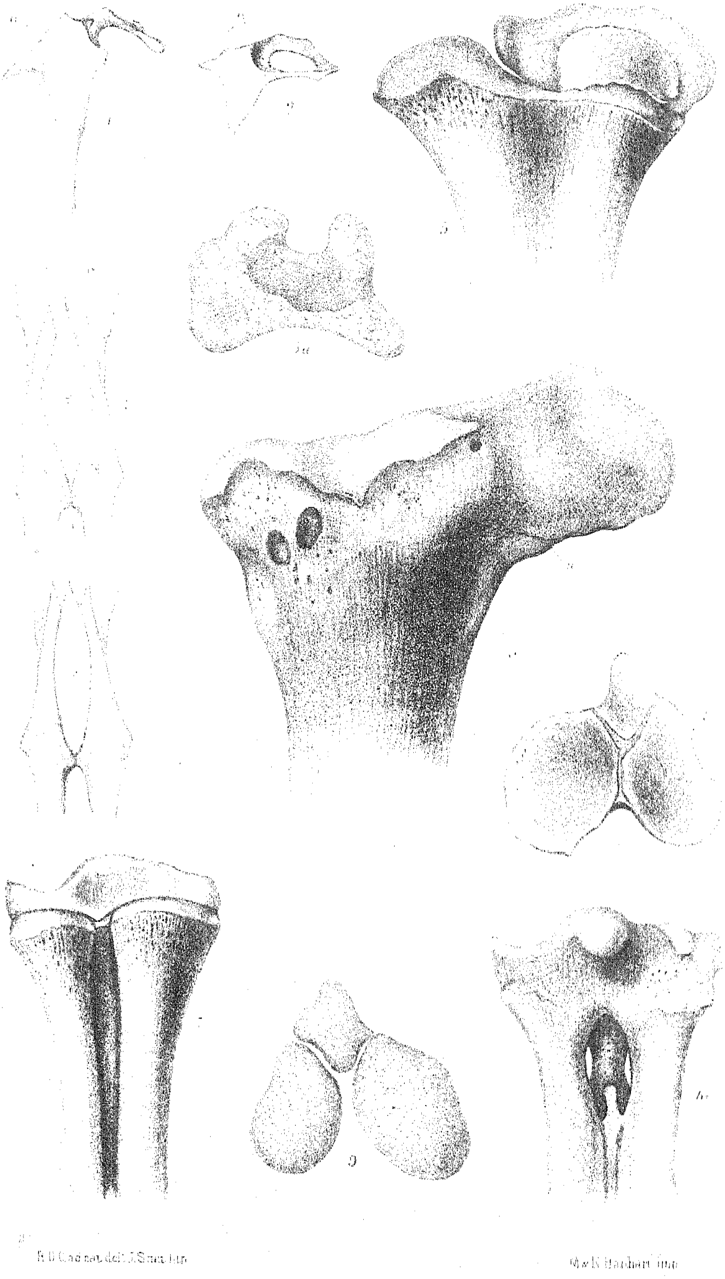
"These four eggs form a complete sitting, and were also collected by Dr. Dybowsky at Darasim in Dauria, together with several others which I also have in my possession, but which do not differ materially from these. I do not know of any collection in England in which the eggs of this Thrush are to be found; and as it is an occasional straggler to Europe, I believe that collectors here present may be interested in examining these. As will be seen, they are in appearance not unlike some varieties of the eggs of the common Fieldfare (*Turdus pilaris*), but are rather smaller in size, increasing from $\frac{19}{20}$ to $1\frac{1}{20}$ inch in length, by from $\frac{29}{40}$ to $\frac{31}{40}$ in width, the ground-colour being bright blue, and the spots with which they are covered dark red.

"RUTICILLA AUROREA.

"One single specimen of the egg, togetherwith about a dozen skins, of this bird were sent over by Dr. Dybowsky from Dauria. This specimen, which I now produce, measures $\frac{30}{40}$ inch in length, by $\frac{21}{40}$ in width, and in colour is very pale blue, minutely covered with pale red markings, which are collected round the larger end, forming an irregular zone.

"MOTACILLA CITREOLA.

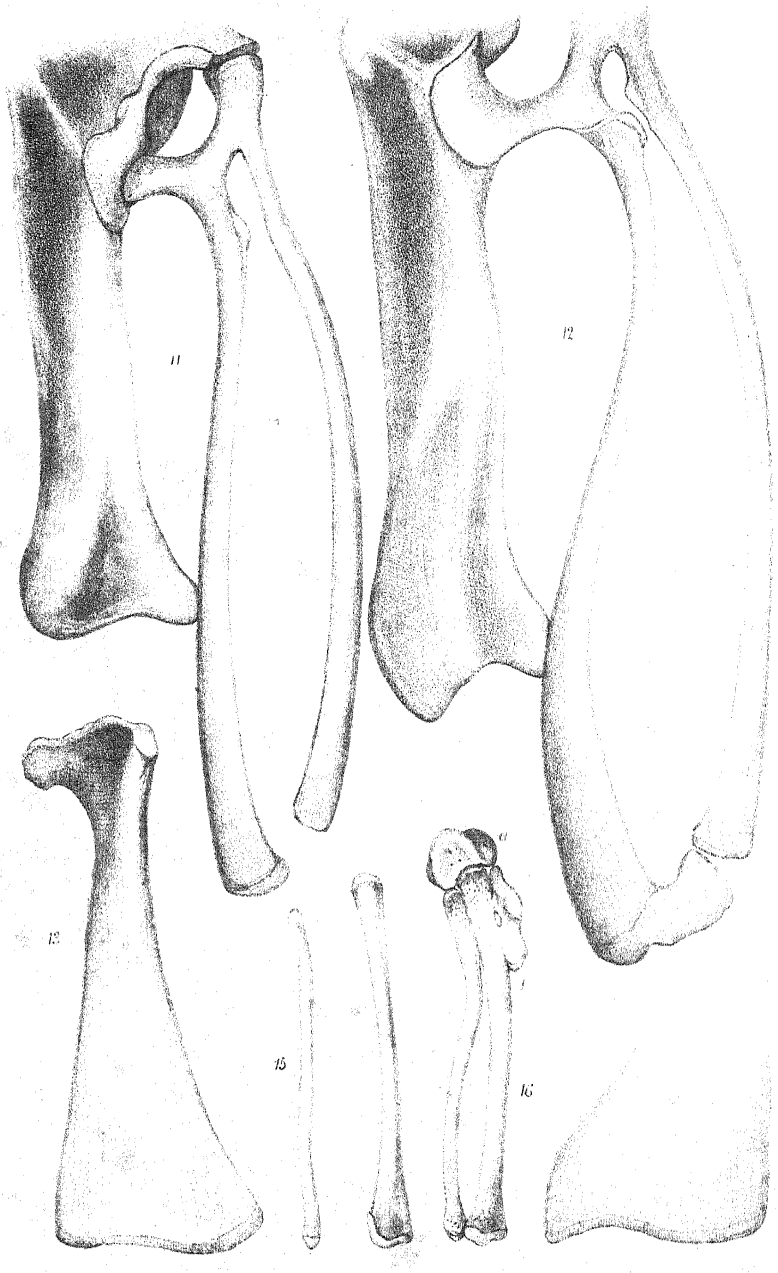
"Amongst the eggs and skins sent over by Dr. Dybowsky from Darasim were several of this bird; and I have the pleasure of exhibiting six (a complete sitting) of the eggs. In size and colour they resemble the eggs of the Grey Wagtail (*Motacilla boarula*) so much that they can scarcely be distinguished from some eggs of this latter bird."



R. B. Cadman del. J. Smit lith.

M & N Hanhart imp.

RHEA AMERICANA & R. DARWINI.



J.G. ad nat. del. J. Smit lith.

M & N Hanhart, imp.

The following papers were read :—

1. Notes on some points in the Osteology of *Rhea americana* and *Rhea darwinii*. By ROBERT O. CUNNINGHAM, M.D., F.L.S., C.M.Z.S.

[Received January 2, 1871.]

(Plates VI. & VI^{a}.)

Three distinct species of American Ostrich (the *Rhea americana*, *R. darwinii*, and *R. macrorhyncha*) are at the present time recognized by ornithologists. The first of these, which, it is almost unnecessary to state, was for a long period the only species of the genus known, appears to possess the widest geographical range, extending, if I am not mistaken, from Bolivia, Paraguay, and South Brazil, at least as far south as the Strait of Magellan*, a space of upwards of thirty degrees. The second was first scientifically described by Mr. Gould, in the 'Proceedings' of this Society for 1837, from a specimen procured by Mr. Darwin at Port Desire, on the east coast of Patagonia, and probably extends from the Strait of Magellan to the Rio Negro, the boundary-line between Patagonia and the Argentine Republic; while for our knowledge of the third, the locality of which is, I believe, as yet undetermined, we are indebted to Mr. Sclater's finely illustrated article on the Struthious birds living in the Society's gardens, published in the fourth volume of the Society's 'Transactions.' In that valuable contribution to our knowledge of the Struthionidæ, its author has briefly pointed out several very well-marked points of distinction between the three species; but concerning these I need not occupy the time of the Society, as they are doubtless well-known to the generality of those who are now present.

I may therefore pass on to remark that, in assigning such an extensive range as I have above indicated to the *Rhea americana*, I am aware that my views on the subject are in conflict with the expressed opinions of a highly distinguished authority (Mr. Darwin), who fixes the southern boundary of this bird at a little to the south of the Rio Negro, observing that *R. darwinii* takes its place in Southern Patagonia. I can, however, positively assert that *R. americana* extends as far south as the Strait of Magellan, inhabiting the same tracts of country as the latter species; for in the course of my sojourn in the eastern portion of the Strait, I had opportunities of seeing a considerable number of recently killed specimens in the possession of the Patagonian Indians; and, although I do not recollect having observed any examples of *Rhea darwinii* in the flesh, I have picked up its characteristic white-tipped feathers in various localities in the plains *.

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* That a species of *Rhea* occurs to the south of the Strait, in the large eastern island of Tierra del Fuego, the northern portion of which is almost identical in its climate and physical characters with those of Eastern Patagonia, may be regarded as certain; but whether it be referable to the *R. americana* or *R. darwinii* I am unable to state.

I regret that I have almost nothing to add to our knowledge of the habits of *Rhea americana,* as it was but seldom that I noticed live examples, and then, owing to their speed of foot, only for a few minutes at a time. I can, however, corroborate the testimony of Mr. Darwin with regard to the facility with which the species takes to the water, one of the officers of the 'Nassau,' a very careful and trustworthy observer, having on one occasion observed several individuals on the south of St. Jago Bay (Strait of Magellan) escape from threatened danger by running into the sea. Further, I may add that, although indiscriminate in its feeding like other members of the tribe, it appears, in common with the Upland Goose (*Chloephaga magellanica*), to cherish a special predilection for the red berries of the *Empetrum rubrum,* a plant very abundant on the grassy plains.

Some months ago Mr. Sclater was good enough to place in my hands for examination and comparison two nearly perfect skeletons of *Rhea americana* and *R. darwinii*; and I now venture to lay a few brief notes on the subject before the Society. Both specimens were those of females, that of *Rhea americana* having apparently belonged to an adult bird, while that of *R. darwinii* bore unequivocal traces of immaturity. It is necessary, of course, to bear this fact in mind, as many of the differences observable are without doubt due to the different ages of the individuals, while a certain number are possibly only the result of individual variation, and others may probably with justice be regarded as marks of specific distinction.

Regarded *in toto,* the differences between the two skeletons are comparatively slight, though perhaps not more so than those which commonly obtain between closely allied species. In the following observations, I would premise that it is not my intention to attempt the very elaborate task of giving a full description of the osteology of the two species, as to do that in a complete and satisfactory manner would have necessitated the examination of a much larger number of specimens than I have had at my command, but to content myself with noting those points which appear to be of the most salient character.

Cranium.—Beginning with the cranium, I may remark that its general contour is very much the same in both species, though certain minute marks of distinction between the individual bones are recognizable on a careful inspection. Thus in the cranium of the specimen of *Rhea darwinii* (in which nearly all the bones are still unanchylosed) the vertical ridge on the supraoccipital is considerably more elevated than in *R. americana,* and the portion of the horizontal plate of the ethmoid not covered by the frontals and nasals is of a different form, being an ellipse with pointed ends instead of a somewhat lozenge-shaped space as in the latter bird. In the former species there is also a much wider unossified space in the interorbital septum between the basi- and presphenoids than there is in the latter; but this is most probably a difference connected with age. On the other hand the lacuna in the ethmo-alisphenoid plate, immediately beneath the horizontal plate of the ethmoid, is nearly twice as large in *Rhea americana* as it is in *Rhea darwinii*. The pterygoid processes of the basisphenoid are also curved more forwards in the former than in the latter. By far the most remarkable distinction in the bones of the skull of the two birds, however, is furnished by the lachrymal. In *Rhea americana* (Pl. VI. fig 1) the strong process directed backwards (anterior orbital process of authors) is much more elongated than in *R. darwinii*, and the form of the descending process is also very different. In the former it curves downwards and backwards so as to produce a deeply excavated space on its posterior border, while in the latter (fig. 2) this process is met by another posterior bar of bone so as to connect the space into a large foramen. This will be more readily understood by a reference to the accompanying sketches, in which fig. 1 represents the bone in *R. americana*, and fig. 2 in *R. darwinii*, the letter *a* in both bones indicating the surface of articulation with the cranium. Other minor differences in the bones of the head are probably due to age.

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* When Dr. Adolf Böcking, in his interesting "Monographie des Nandu oder südamerikanischen Strausses," in Wiegmann's Archiv for 1863 (for a reference to which I am indebted to Mr. Sclater), speaks of *R. americana* and *R. darwinii* as climatic varieties comparable with those of *Perdix cinerea,* it is difficult to avoid the conclusion that he has never carefully examined specimens of the two birds; and his hypothesis is disproved by the fact of their occurring in the same district.

Vertebræ.—Except in point of size, the vertebræ of the two species differ but little from one another. I find twenty-one free vertebræ present in *R. americana* between the head and the lumbo-sacral portion of the vertebral column; but the axis is wanting in this specimen; so that the total will be twenty-two should none of the other vetebræ be absent, which does not appear to be the case. As in the specimen of *R. darwinii* either four or five of the cervical vertebræ have been lost, I cannot speak with absolute certainty as to the number of free vertebræ present; but in all probability it is the same as in *R. americana*. The styloid processes (pleurapophyses) of all the cervical vertebræ examined in *R. darwinii* exist as separate bones, as might, indeed, be expected from the immature condition of the individual. They are fully anchylosed in the third, fourth, and fifth vertebræ (putting the atlas, in which they do not exist, and the axis, which is missing, out of the question) of *R. americana*, partially so in the sixth, seventh, and eighth, and separate thence to the first rib-bearing vertebra.

In both species there are eight rib-bearing vertebræ, the eighth being partially anchylosed to the lumbo-sacral portion of the column. No very obvious differences, save those of size, are to be observed between the vertebral ribs of the two species. In both but three (the third, fourth, and fifth) are connected with the sternum by means of costal ribs. There is likewise no material difference in the form of the sterna of the two birds, allowing for the influence of age. In *R. americana* the two lateral halves (pleurostea) are united rather firmly together, but would admit of separation without much difficulty; while in *R. darwinii* they are separate, partly in consequence of immaturity of development, but also, I am inclined to believe, from more prolonged maceration.

Pelvis.—On comparing the pelves of the two birds it will be noticed that in *R. americana* the transverse processes of two vertebræ abut upon the iliac bone of either side, opposite its junction with the ischium and pubis; while in *R. darwinii* the transverse process of but one vertebra occupies this position, and this process is much shorter than the corresponding processes in *R. americana,* so that the acetabula of opposite sides are further removed from one another in that bird than in *R. darwinii.* In the specimen of the latter bird, owing to its youth, the ischiatic and pubic bones, though anchylosed to one another, are not yet anchylosed to the ilium, while in the older specimen of *R. americana* they are firmly anchylosed, although still presenting indications of the line of junction. A considerable difference, perhaps due in part to age, obtains between the posterior extremities of the ischium and pubis in the two birds. In *R. darwinii* they are separated by a considerable space, while in *R. americana* they are nearly in contact, owing to the development downwards and forwards of a strong process from the ischium.

Shoulder-girdle.—In the specimen of *R. americana* the coracoid and scapula are anchylosed, while in that of *R. darwinii* they are separate. In the former the strong internal process at the scapular end of the coracoid is much more developed than in the latter; and the inner border of the sternal extremity of the same bone is of a different form in the two birds, in *R. americana* being as it were cut away for the space of about a quarter of an inch, while in *R. darwniii* it presents a convex curve. A strong rounded process occurs at the proximal extremity of the scapula, at about the middle of its antero-inferior surface in *R. americana,* and is but feebly indicated in *R. darwinii.*

Bones of the Wing.—The humerus, radius, and ulna of the two birds present no conspicuous differences, save those of size. I have been unable to institute a comparison between the carpal bones of the two species, as they are incomplete in the skeleton of *R. americana* and missing in that of *R. darwinii.* In the former the os magnum is anchylosed to the proximal ends of the second and third metacarpals, and all three metacarpals are partially anchylosed; while in the latter the os magnum is unanchylosed (missing), and all three metacarpals are as yet ununited. These latter bones closely resemble each other in form in both birds, with the exception that in the specimen of *R. americana* they are much more curved than in *R. darwinii.* This difference may possibly, however, be of an individual, not of a specific nature. The digits are incomplete in both skeletons, so that they could not be compared.

Bones of the Leg.—The general form of the femur is the same in both skeletons; but the intercondyloid fossa is much deeper in *R. darwinii* than in *R. americana,* and is due probably to its youthful condition. The various elevations and depressions on the shaft of the bone, indicative of the origin and insertion of muscles, are, as might be expected, more distinctly marked in the latter species. In the tibia of *R. americana* a strong procnemial ridge is developed from the epicnemial process; while in that of *R. darwinii* the process and ridge are in a rudimentary condition, but would doubtless have increased with the advancing age of the bird. In the latter an epiphysis still remains ununited to the superior extremity of the bone, while in the former it is firmly anchylosed and only indicated by a roughened line. This epiphysis bears the epicnemial process, and also forms about half of the superior articulating surface of the tibia. Very little difference is observable between the distal ends of this bone in the two species. In neither is there any trace of suture indicative of the junction of the tarsal element (astragalus), which furnishes the trochlear surface, articulating with the tarso-metatarsal. As in other Struthionidæ, so in neither *R. americana* nor *R. darwinii* is there a bony bridge over the precondylar groove which lodges the tendon of the extensor longus communis digitorum; but in both a tuberosity is present at the outer side of the groove. The *fibulæ* could not be compared, as the bone was missing in the specimen of *R. darwinii*. Nearly all the differences exhibited by the tarso-metatarsus of both species may probably be ascribed to the difference in age. Thus this bone of *R. darwinii* differs from that of *R. americana* in the complete separation of the tarsal element, as well as that of the proximal extremeties of the three metatarsals. In both skeletons the innermost of the three trochlear condyles of the distal end of the bone is the shortest. In *R. americana* the tendinal groove between the outer and middle trochlea is spanned by a bony bridge, which is not fully developed in *R. darwinii*. The anterior surface of the shaft of the metatarsus is more deeply hollowed out in *R. americana* than in *R. darwinii*; but in the latter the posterior surface is more excavated than the former, and is further defined externally by a strongly marked ridge. No noteworthy differences, with the exception of those of size, appear to prevail between the bones of the toes in the two species. They are proportionally longer in *R. darwinii* than in *R. americana*.

I subjoin a list of measurements of the bones:—

	R. americana.		*R. darwinii.*	
	in.	lin.	in.	lin.
Length of cranium from occipital condyle to top of upper mandible	5	9½	5	0
Length of ilium, measured along mesial line of dorsal surface of pelvis	11	0	8½	0
Length of sternum from proc. lat. ant. to posterior border	5	0	3	10
Length of coracoid	3	8	3	2
——— scapula, measured in straight line	4	11	3	11
——— humerus	9	3	7	9
——— ulna	6	8	5	4
——— radius	6	6½	5	3
——— middle metacarpal	2	3	2	2
——— femur	7	5	6	9
——— tibia, measured along inner surface	11	3	10	9
——— tarso-metatarsus	11	0	10	0

EXPLANATION OF PLATES VI. & VI^a.

Fig. 1. Right lachrymal of *R. americana*, seen from the side.
2. Right lachrymal of *R. darwinii*, seen from the side. In both, *a* marks the surface of articulation with the skull.
3. Ethmoido-nasal region of *R. americana*, viewed from above.
4. Ethmoido-nasal region of *R. darwinii*, viewed from above. In both, E marks the horizontal plate of the ethmoid, F the frontals, N the nasals. and I the tip of the nasal process of the intermaxillary.
5. Superior extremity of left tibia of *R. darwinii*, seen from the inner side, with the epiphysis. *a*, epiphysis, seen from above.
6. Superior extremity of left tibia of *R. americana*, showing the strongly developed procnemial process. *a*, line indicating the junction of epiphysis.
7. Upper extremity of right tarso-metatarsus of *R. darwinii*, showing the tarsal element *in situ* and the separated heads of the three metatarsals.
8. Inferior surface of tarsal element of *R. darwinii.*
9. Superior surface of heads of three metatarsals of *R. darwinii.*
10. Upper extremity of right tarso-metatarsus of *R. americana*, showing anchylosis of tarsal element and of heads of the three metatarsals.
11. Right side of posterior part of pelvis of *R. darwinii.*
12. Right side of posterior part of pelvis of *R. americana.*
13. Left coracoid of *R. darwinii.*
14. Sternal extremity of left coracoid of *R. americana.*
15. Second and third metacarpals of *R. darwinii.*
16. Metacarpus and os magnum (*a*) of *R. americana.*

2. Catalogue of an Arctic Collection of Birds presented by Mr. John Barrow, F.R.S., to the University Museum at Oxford; with Notes on the Species. By James Edmund Harting, F.L.S., F.Z.S.

[Received January 6, 1871.]

A recent donation by Mr. John Barrow, F.R.S., to the University Museum at Oxford has afforded ornithologists an opportunity of examining an interesting collection of birds from high northern latitudes. Through his interest at the Admiralty, Mr. Barrow was enabled to enlist the services of several naval officers who took part in the various arctic expeditions which were fitted out from time to time between the years 1848 and 1855; and through their exertions the present collection was brought together.

These officers were:—Capt. Sir Leopold M^{c}Clintock, F.R.S., Capt. (now Vice-Admiral) Collinson, C.B., H.M.S. 'Enterprise,' 1850–54; Mr. Anderson, Surgeon to the 'Enterprise;' Capt. (now Rear-Admiral) Moore, H.M.S. 'Plover,' 1849–50; the late Lieut. Elliot, H.M.S. 'Phœnix,' 1853–54; Mr. Holman, Surgeon to the 'Phœnix;' Dr. M^{c}Cormick, H.M.S. 'North Star,' 1852–53; Capt. Penny, H.M. discovery-ship 'Lady Franklin;' Capt. (now Rear-Admiral) Richards, H.M.S. 'Assistance,' 1854; the late Lieut. W. Hulme Hooper, R.N., 1851; Mr. Abernethy, Ice-master to the 'Felix,' 1851.

The collection is comprised in 43 separate glass cases, containing 83 birds, belonging to 48 species; and some of these, from their comparative rarity, or from the particular state of plumage in which they happen to be, are of much interest and value.

Chief amongst these may be noted that curious little bird the Spoonbilled Sandpiper (*Eurynorhynchus pygmæus*), of which the only specimen in summer plumage at present known to exist is in this collection *. It was obtained by Capt. Moore on the Choris Peninsula, where the same officer also procured a specimen of the Mongolian Plover, *Ægialites mongolicus* (Pallas), in breeding-plumage, the most northern locality recorded for this species (*cf.* Ibis, 1870, p. 386).

Four species of that curious genus of tufted and horned Puffins (*Phaleris*) are in the collection, taken off the coast of Kamtschatka, and a remarkably fine pair of Sabine's Gull (*Larus sabini*), in breeding-plumage, obtained by Capt. Collinson, of the 'Enterprise,' off Melville Peninsula.

The geographical distribution of the species, as exemplified by the present collection, will be best understood by a reference to the map which I have designed to accompany it. From this it will be seen that many species have a more extensive range than has been hitherto suspected. That pretty little bird the Lapland Bunting was found on the Choris Peninsula, on the Mackenzie River, and on the south-west coast of Greenland; the Raven on the same peninsula, and on Beechy Island, Barrow Straits; the Golden Plover on the coast of Behring's Straits, Mackenzie River, and Melville Peninsula. The Purple Sandpiper, which was thought to be restricted to eastern North America and Europe (*cf.* Baird's Birds N. Amer.), was obtained by Captain Moore on the north-western shores of Behring's Straits.

The American Coot, *Fulica americana*, Gmelin, which had not previously been met with above 55°, was found by Lieut. Elliot of the 'Phœnix' almost as high as 70° in Jacob's Haven, opposite Disco; while the species holding the most northern range was found to be the Rock-Grouse, *Tetrao rupestris* (Gmelin), which was noted as plentiful on Melville Island, and was met with on the coast of North Devon by Capt. Richards, in the 'Assistance.'

This glance at the distribution of the birds leads to the inquiry whether some of the species met with in the nearctic region, and considered to be distinct, are not in fact identical with certain palæarctic species:—whether, for example, the Raven met with upon these expeditions is not identical with the European Raven; whether the Golden Plover obtained on the Choris Peninsula should be referred to the Asiatic *C. longipes*, or the American *C. virginicus*, or whether these two are not in fact identical; whether the Dunlin Sandpiper procured in the same locality should be considered distinct, under the title of *americana*, from the European and Asiatic *alpina*.

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* This specimen was described and figured in 'The Ibis' for 1869, p. 426, pl. xii.

These and other similar questions will be found adverted to under the head of the species to which they refer; and it has been deemed expedient to add to the catalogue such references and notes as may be likely to aid the researches of the student who may have occasion to consult it.

In consequence of several birds belonging to different species, and in some cases to widely different genera, being grouped together in one and the same case, it has not always been possible to arrange the cases satisfactorily. Subject to this inconvenience, the collection may be catalogued as follows:—

Case 1. GREENLAND FALCON.

Falco candicans, Gmelin, Syst. Nat. i. p. 275 (1788).
Falco grœnlandicus, Daudin, Traité d'Orn. ii. p. 107 (1800).

According to Holböll this beautiful Falcon, which in the adult state is nearly pure white, is a resident species in Greenland. It is found nevertheless in other countries of the north, and has several times been procured in Great Britain. The two specimens in this case were killed at Disco, in 1853, by Dr. M'Cormick, of H.M.S. 'North Star.'

Case 2. PEREGRINE FALCON.

Falco peregrinus, Gmelin, Syst. Nat. i. p. 272.

A male bird, caught at the masthead of H.M.S. 'North Star,' in Davis Straits, close to the coast of Greenland, in the spring of 1852.

Case 3. SNOWY OWL.

Strix nyctea, Linn. Syst. Nat. i. p. 132 (1766).
Nyctea nivea, Daudin, Traité d'Orn. ii. p. 190 (1800).

Some interesting notes on the migration of the Snowy Owl, as observed by Captain M'Kechnie, of the ship 'John and Robert,' between Quebec and Belfast, will be found in the 'Annals of Natural History' for April 1839.

Cases 4 & 5. RAVEN.

Corvus corax, Linn.

A male bird killed on Beechy Island, Barrow Straits, 1st August, 1853, and brought home by Dr. M'Cormick, of H.M.S. 'North Star;' and a second obtained on Choris Peninsula, Behring's Straits, in 1849, by Capt. Moore, in H.M.S. 'Plover.'

Whether the American Raven is identical with the European *Corvus corax*, or a distinct species, is not quite clear. Prof. Schlegel has figured the head of a Raven from Labrador side by side with one from Germany; and the superiority in size of the former is very apparent*. From the measurements given in the article referred to, it appears that specimens from Labrador and Greenland exceed others from Holland and Germany by 3 inches in total length, by 2½ inches in length of wing, by ¼ inch in length of bill, by ⅓ inch in length of tarsus. According to Prince Maximilian*, the only difference discernible to him between the European and American Ravens was the slender bill of the former. Prof. Baird says†, "I have not at hand specimens of the European Raven for the purpose of making a critical comparison with our own; but most recent authors agree in considering them distinct, although Audubon maintained the contrary opinion."

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* "Notice sur le genre *Corvus*," Bijdrag. Koninkl. Zool. Genoots. Amsterdam 1859.

Case 6. SNOW-BUNTING.

Emberiza nivalis, Linn. Faun. Suec. p. 82.
Plectrophanes nivalis, Meyer, Taschenb. Deutsch. Vög. p. 58.

Two in early spring plumage, brought home by Lieut. Hulme Hooper, R.N., in 1851, from Mackenzie River.

Case 7. In this case are nine birds, belonging to four species, namely:—

LAPLAND BUNTING.

Emberiza lapponica, Nilsson, Orn. Suec. i. p. 157.
Plectrophanes lapponica, Selby, Linn. Trans. xv. p. 156, pl. i.

Two males and a female; Godshaab, June 3, 1865.

MEALY REDPOLE.

Two females; Godshaab, June 1, 1865.

GREY PHALAROPE.

Phalaropus fulicarius (Linn.).

Two; Godshaab, June 13, 1865. This bird in summer plumage is the *Tringa fulicaria* of Linnæus, Syst. Nat. i. p. 249, and in winter his *Tringa lobata* (*l. c.*).

RED-NECKED PHALAROPE.

Phalaropus hyperboreus (Linn.).

For this species, of which there are two specimens in the case, no locality is noted.

Case 8. In this case are four species belonging to widely different genera, all of which appear to have been brought from Mackenzie River, probably by Lieut. Hulme Hooper, R.N., before referred to.

LAPLAND BUNTING.

Plectrophanes lapponica (Nilsson).

A male.

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* Reise durch Nord-Amer. ii. p. 289.

† Birds N. America, p. 561.

RUSTY BLACKBIRD.

Scolecophagus ferrugineus, Swainson; Baird, Birds N. Amer. p. 551.

Scolecophagus niger, Bonap. Consp. p. 423.

Turdus hudsonius and *noveboracensis*, Gmelin, Syst. Nat. i. p. 818.

TURNSTONE.

Strepsilas interpres, Illiger, Prod. Mamm. et Av. p. 263.

Tringa interpres, Linnæus, Faun. Suec. p. 63.

Cinclus interpres, G. R. Gray, Gen. B. iii. p. 549.

GOLDEN PLOVER.

Charadrius virginicus, Borckhausen and Bechstein, Licht. Verz. Doubl. 729 (1823).

Charadrius pluvialis, Wilson, Am. Orn. vii. p. 71, pl. lix.; Swainson, Faun. Bor.-Amer. ii. p. 623 (*nec* Linnæus).

Case 9. The birds in this case, eleven in number, and belonging to eight species, were procured by Captain Moore, of H.M.S. 'Plover,' on the Choris Peninsula, Behring's Strates, in 1849. The species are:—

GREY-HEADED WAGTAIL.

Budytes flava (Linnæus).

SNOW-BUNTING.

Plectrophanes nivalis (Linnæus).

Two.

LAPLAND BUNTING.

Plectrophanes lapponicus (Nilsson).

MONGOLIAN PLOVER.

Ægialites mongolicus, Pallas, Reise, iii. p. 700; Zoogr. R.-A. ii. p. 136.

Ægialites pyrrhothorax, Temm. Man. d'Orn. 2nd ed. iv. p. 355.

Two in summer plumage. The most northern locality recorded for this species (*cf.* Harting, 'Ibis,' 1870, p. 389).

SPOONBILL SANDPIPER.

Eurynorhynchus pygmæus (Linnæus), Pearson, J. A. S. B. v. p. 127.

Eurynorhynchus griseus, Nilsson, Orn. Suec. ii. p. 29.

Eurynorhynchus orientalis, Blyth, Ann. Mag. Nat. Hist. xiii. p. 178.

This specimen may be characterized as the rarest in the collection. Very few specimens have ever been procured; and this is the only one in *summer* plumage known to exist. A figure and description of this specimen will be found in 'The Ibis,' 1869, p. 426.

DUNLIN.

Tringa alpina, Linn. Syst. Nat. i. p. 249.
Tringa cinclus, Linn. *op. cit.* p. 251.
Tringa variabilis, Meyer, Taschenb. Deutschl. Vög. ii. p. 397.

This specimen is interesting as having been procured at a point where the European Dunlin, which is also found in Asia, would be expected to meet the variety *americana* of Cassin. Prof. Baird considers that *T. americana* is entitled to rank as a species. He says:—"Of eight specimens from Europe and Asia now before us, not one ought to be considered as specifically the same as the American bird. The size (of the former) is invariably smaller, and the bill disproportionately shorter. In fact we have little doubt that the bird inhabiting both the Atlantic and Pacific coasts of the Republic is quite distinct, and may be easily recognized" (Birds N. Amer. p. 719). On comparing a specimen from New Jersey, in full summer plumage, with one which was shot off the nest in Benbecula (Hebrides), not only are the differences pointed out by Prof. Baird apparent, but it is also observable that the upper portions of the plumage in the American bird are considerably pervaded by bright rufous brown, whereas in the same parts of the Scottish bird black is the prevailing colour. Further, the black of the underparts, which in the Scottish bird extends (as in *Squatarola helvetica*) from the vent almost to the chin, is confined in the American bird (as in *Eudromias morinellus*) to the belly only. Whether this large race of Dunlin, known as *Tringa americana*, is specifically distinct or not, it is not confined to America as is generally supposed. I have specimens in winter plumage now before me, procured by Mr. Swinhoe in Amoy, and others in autumn plumage shot by myself in this country, which, as regards measurements of bill, wing, and tarsus, correspond in every way with examples from New Jersey. They differ only in colour, having been obtained at different seasons of the year. As far as I can judge by the data before me, the smaller bird appears to have a more restricted range, and remains to nest in this country; while the larger bird does not breed with us, but is found on our coasts in spring and autumn, during the migration.

GOLDEN PLOVER.

Charadrius longipes, Temminck.
Charadrius xanthochilus, Wagler, Syst. Av.
Charadrius orientalis, Temm. & Schleg. Faun. Jap. p. 104, t. 62; Gould, B. Australia, vi. pl. 13.

A similar difficulty here presents itself. We have a bird which, from the locality from which it was obtained, may be either the Asiatic *C. longipes* or the American *C. virginicus**.

The characters by which these two may be distinguished have not been defined. Both are smaller than the European *C. pluvialis*; and both differ from it in having the axillary plumes smoke-grey instead of pure white. The tarsus, also, is somewhat longer and more slender in proportion than that of the European bird. I have now before me eight skins of *C. virginicus* from various American localities, north and south, and fourteen skins of *C. longipes* from India, China, Australia, and the Malay archipelago. A careful comparison of these gives the following results:—(1) That *C. longipes* is invariably smaller than *C. virginicus*, the respective measurements being as under—

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* Both these forms have been distinctly recognized by Prof. Blasius as having occurred on different occasions in Heligoland (*cf.* 'Ibis,' 1862, p. 71); and *C. longipes* has occurred in Malta (*cf.* 'Ibis,' 1865, p. 462).

	Bill. in.	Wing. in.	Tarsus. in.
C. virginicus	1	7 to 7·4	1·6
C. longipes........	·8 to ·9	6·4 to 6·6	1·5
C. pluvialis	·9	7·5	1·4

(2) That *C. virginicus* at all seasons (but more especially in winter) has far less of the golden colour on the dorsal plumage and on the breast than *C. longipes* has, the prevailing colour on the former bird being brown of two shades in winter, interspersed with black and golden in summer.

I have a Golden Plover in my collection which was taken at sea in lat. 69° 30′ N., long. 173° 20′ E., many miles N.W. of Point Barrow. This is the furthest point north, so far as I am aware, at which a Golden Plover has been met with. Its measurements are, bill ·8 in., wing 6·5, tarsus 1·5.

These measurements, as well as the general coloration, show that the specimen is referable to the Asiatic, and not to the American race, although it was met with much nearer to the American than to the Asiatic coast.

The Golden Plover from Australia is identical in every way with the bird from India, China, and the Malay countries.

PURPLE SANDPIPER.

Tringa maritima, Brünnich, Orn. Bor. p. 54.
Tringa striata, Linn. Syst. Nat. i. p. 248.

Prof. Baird gives Eastern North America and Europe as the habitat of this species. Its appearance in this case on the N.W. coast of N. America shows that it has a more extensive range. The Purple Sandpiper visits the Faroe Isles, Iceland, Greenland, and Spitzbergen; and Von Baer found it in Nova Zembla—an observation recently confirmed by Mr. Gillett (*cf.* Ibis, 1870, p. 306). Sir Edward Parry found it common in Davis Straits and Baffin's Bay, on Winter Island, Port Bowen, and Hecla Cove. Sir J. Richardson says that it breeds on Melville Peninsula and the shores of Hudson's Bay.

Case 10 contains another example of this species (*T. maritima*). American and European specimens are absolutely identical.

Case 11. The five birds, of different species, in this case were procured by Captain Collinson, C.B. (to whom reference has been before made), in H.M.S. 'Enterprise.' No locality is recorded for any of them; but, judging from the localities attached to the other birds procured by the same officer, they were doubtless obtained in high northern latitudes. The five species are:—

GREY PLOVER.

Squatarola helvetica (Linnæus).

One of the most widely distributed species. It frequents the sea-coasts, and fresh and salt waters of all known countries within the temperate and tropical zones.

GOLDEN PLOVER.

Charadrius virginicus, Borckhausen.

Before referred to, in cases 8 & 9.

LITTLE RINGED PLOVER.

Ægialites minor, Boie, Isis, 1822, p. 558.

It is a little remarkable if this bird was obtained on the coast of North America, as it has not hitherto been recognized as an American species. Its place is supplied by *Æ. semipalmatus* in the New World, where our common Ringed Plover (*Æ. hiaticula*) is represented by the larger-billed *Æ. wilsonii*.

BUFF-BREASTED SANDPIPER.

Tringa rufescens, Vieillot, N. Dict. d'Hist. Nat. xxxix. p. 470; Baird, Birds N. Amer. p. 739; Yarrell, Trans. Linn. Soc. xiv. p. 109, pl. 2.

A good specimen of an American bird which, although not rare, it is very difficult to procure.

GREY PHALAROPE.

Phalaropus fulicarius (Linnæus).

Before noted, in case 7.

Case 12. AMERICAN COOT.

Fulica americana, Gmelin, Syst. Nat. i. p. 704; Sabine, Frankl. Journ. p. 690; Faun. Bor.-Amer. (Birds) p. 404.
Fulica atra, Wilson, Am. Orn. ix. p. 61, pl. lxxiii.
Fulica wilsonii, Stephens, Shaw's Zool. xii. p. 236.

Distinguishable from the European *Fulica atra* by the white on the crissum and wings, and by the frontal plate being red instead of white. The authors of 'Fauna Boreali-Americana' state (*l. c.*), "It was not seen by us near Hudson's Bay, nor higher than the 55th parallel." The specimen in this case is from Jacob's Haven, opposite Disco, and was brought home in 1854 by Capt. Elliot, in H.M.S. 'Phœnix.'

Cases 13, 14, 15. ROCK-GROUSE.

Lagopus rupestris (Gmelin).
Tetrao ruprestris, Gmelin, Syst. Nat. i. p. 751.
Lagopus rupestris, Leach, Zool. Misc. ii. p. 290.

This, the American Rock-Grouse, differs from the Willow-Grouse (*Lagopus albus**, Gmel.), which is also found in Northern America, in its superior size and shorter and stouter bill. The male, too, has a black stripe through the eye, which is not found in either sex of the Willow-Grouse. Figures of both species will be found in the 'Fauna Boreali-Americana,' ii. pp. 351 & 354.

The Rock-Grouse is reported by Captain Sabine (*l. s. c.*) to be common in summer on Melville Island, a locality whence several other species in this collection were obtained.

The specimen in case 13 is an adult female, in full summer plumage, procured by Capt. Richards, H.M.S. 'Assistance,' in Wellington Channel, in 1854.

Case 14 contains a female bird in autumn plumage, obtained on the west coast of Greenland, in 1853, by Capt. Elliot, in H.M.S. 'Phœnix.'

The example in case 15 is in winter plumage, and was brought home by Capt. Collinson, C.B., in H.M.S. 'Enterprise' (1850–54).

Case 16. Eider Duck.

Somateria mollissima, Leach.

Anas mollissima, Linnæus, Syst. Nat. i. p. 198.

A male bird from Cape Sahacketon, Baffin's Bay, brought home by Capt. Elliot, H.M.S. 'Phœnix,' in 1854.

Although not uncommon on the Atlantic and Arctic coasts of the northern hemisphere, this bird does not appear to have been met with on the North-Pacific coast.

Case 17. King Duck.

Somateria spectabilis, Leach.

Fig. 1.

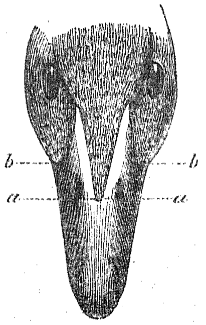

Fig. 2.

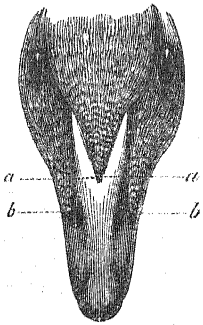

Fig. 1. Upper surface of bill of King Duck.
2. Upper surface of bill of Eider Duck.

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* *Lagopus albus*, Audubon, B. Amer. v. p. 114, pl. 299. *Tetrao saliceti*, Sabine, App. Frankl. Nar. p. 681; Richardson, App. Parry's Second Voy. p. 347; Swainson, Faun. Bor.-Amer. ii. p. 351.

The case contains a male and female of this species; but the locality whence they were procured has not been noted.

The female of the King Duck, although as a rule somewhat smaller and redder, so closely resembles the female of the Eider, as to be with difficulty recognized except by comparison. A good mark of distinction, however, is the relative position of the ridge of feathers which runs down the centre and each side of the bill. In the Eider the centre ridge (fig. 2, *a a*) is shorter than the lateral ridges, *b b*; in the King Duck (fig. 1) the reverse is the case.

Case 18. HARLEQUIN DUCK.

Clangula histrionica (Leach); Swainson, Faun. Bor.-Amer. ii. p. 459.

A male, in summer plumage, procured at Holsteinborg, on the north coast of Greenland, by Capt. Elliot, in H.M.S. 'Phœnix,' in 1854.

The female is much inferior in size to the male; and the young male resembles the female.

Case 19. LONG-TAILED DUCK.

Anas glacialis, Linnæus, Syst. Nat. i. p. 203.
Harelda glacialis, Leach, Gen. Zool. xii. p. 174.

A male bird; no locality noted.

Case 20. RED-BREASTED MERGANSER.

Mergus serrator, Linnæus, Faun. Suec. p. 48.

A male, in summer plumage, procured at Holsteinborg, Davis Straits, in 1854, by Capt. Elliot, H.M.S. 'Phœnix.'

Case 21. GREAT NORTHERN DIVER.

Colymbus glacialis, Linn. Syst. Nat. i. p. 221.

This bird, in the summer plumage, was obtained by Mr. Anderson, Surgeon to H.M.S. 'Enterprise,' on the northern coast of America in 1851.

Case 22. BLACK-THROATED DIVER.

Colymbus arcticus, Linn. Syst. Nat. p. 221.

A fine specimen, in summer plumage, procured by Capt. Moore, H.M.S. 'Plover,' in Behring's Straits in 1853.

Case 23. RED-THROATED DIVER.

Colymbus septentrionalis, Linn. Syst. Nat. i. p. 220.

In summer plumage. Killed in Davis Straits in 1853 by Mr. Holman, Surgeon to H.M.S. 'Phœnix.'

This species has a wide geographical range both in Europe and America. Professor Baird says that on the latter continent during the winter it goes as far south as Maryland, and that it is also found on the Pacific coast.

Case 24. COMMON GUILLEMOT.

Uria troile, Linn. Syst. Nat. p. 220.

In summer plumage. No locality noted. Common on the northern coasts of Europe and America. A specimen in the Museum of the Smithsonian Institution was obtained by the expedition under Capt. Rodgers, on Herald Island, inside Behring's Straits.

Case 25. BRÜNNICH'S GUILLEMOT.

Uria brünnichii, Sabine, Trans. Linn. Soc. xii. p. 539.

A good specimen in summer plumage, with the eggs. Brought home in 1851 by Mr. Abernethy, ice-master to H.M.S. 'Felix.'

Although similar in colour to *Uria troile*, this species is recognizable by its much shorter and stouter bill. It is found on the northern coasts of Europe, Asia, and America, and on the last named it is said to be the commoner species (*cf.* Baird, B. N. Amer. p. 915).

Cases 26 & 27. BLACK GUILLEMOT.

Uria grylle, Linn. Syst. Nat. p. 220; Latham, Ind. Orn. ii. p. 797.

Two in summer plumage (26), and one in winter (27). The locality not noted.

Case 28. RAZORBILL.

Alca torda, Linn. Syst. Nat. p. 210.

For this specimen, which is in summer plumage, no locality has been noted. The species is very abundant on the N.E. coast of N. America, and appears to be in every way identical with the Old-World species.

Case 29. LITTLE AUK.

Alca alle, Linn. Faun. Suec. p. 50.

Male, female, and young; the two last (taken from the nest in Wolstenholm Sound, lat. 76½° N., long. 68° W.) were brought home in 1851 by Mr. Abernethy, ice-master to H.M.S. 'Felix.'

Case 30. NORTHERN PUFFIN.

Mormon glacialis, Leach (*nec* Audubon, *nec* Gould); Baird, Birds N. Amer. p. 903.

Killed in Behring's Straits, and brought home by Capt. Moore, H.M.S. 'Plover,' 1849-50.

Professor Baird thinks this may be the young of *M. corniculata*, Naumann, "only differing from it in having the throat white, or light ashy" (instead of black), "and a short obtuse horn over the eye" (*cf.* Birds N. Amer. p. 903). It is possible, however, that the specimens which suggested this opinion were immature, or obtained in winter. Professor Newton, who procured several specimens of *M. glacialis* in Spitzbergen, and who considers it distinct from both *M. corniculata* and *M. arctica*, has figured it with a black throat (*cf.* 'Ibis,' 1865, pp. 212, 213, pl. vi.).

Case 31. CRESTED PUFFIN.

Phaleris cristatella, Bonap. Comp. List (1838) *nec* Temm.; Baird, Birds N. Amer. p. 906.

Alca cristatella, Pallas, Spic. Zool. v. p. 18.

Three procured in Behring's Straits, 1849-50, by Capt. Moore, H.M.S. 'Plover.'

This remarkable genus, of which the present collection contains four species in good preservation, is peculiar to Kamschatka, the islands contiguous to Japan, and Bird Islands between Asia and America. In most collections this genus is very poorly represented, owing to the great difficulty of obtaining specimens; and it would not be easy to find anywhere a better series than is here exhibited.

The present species, *Phaleris cristatella*, Bonap., is the largest of the genus. It is easily recognized by the upright horny caruncles on the bases of both mandibles. In a fresh state the colour of the bill and of these caruncles is bright orange-red at the base, and yellow at the tip.

Case 32. PARROT-BILLED PUFFIN.

Phaleris psittacula, Stephens, Gen. Zool. xiii. p. 44 (1826).

Alca psittacula, Pallas, Spic. Zool. v. p. 13.

Ombria psittacula, Eschscholtz, Zool. Atlas, iv. 3; Baird, Birds N. Amer. p. 910.

Three specimens, also procured in Behring's Straits by Capt. Moore, who found the species most numerous towards the western shores of America. Prof. Baird, who has included this species in his 'Birds of North America' under the title of *Ombria psittacula*, appears to think that, although nearly related to *Phaleris*, it has a stronger relationship to *Mormon*. Alluding to the very singular bill which characterizes this species, and which seems to attain a maximum of oddity amongst the queer bills of this family of birds, he adds, "the whole affair looks as if it might be a nose of wax, badly pinched and jerked upwards, especially the under mandible."

Case 33. LITTLE HORNED PUFFIN.

Phaleris microceros, Brandt, Bull. Acad. St. Pétersb. i. p. 346 (1837); Baird, Birds N. Amer. p. 908.

Phaleris nodirostra, Bonap. Comp. List, p. 66 (1838).

Three from the same source as the last named.

The species appears to be common on the coasts of North-western America and North-eastern Asia.

Case 34. TUFTED PUFFIN.

Phaleris cirrhata (Gmelin).

Alca cirrhata, Gmelin, Syst. Nat. i. p. 553; Pallas, Spic. Zool. v. p. 7.

Mormon cirrhatus, Bon. Syn. 429; Baird, Birds N. Amer. p. 902.

Two from the same source as the last mentioned.

The Tufted Puffin is one of the most abundant species of this family on the coasts of Western and North-western America. It is easily recognized by the pendent crest-like feathers on each side of the head, and seems to form a connecting-link between *Mormon* and *Phaleris*.

Cases 35 & 36. IVORY GULL.

Larus eburneus, Gmelin, Syst. Nat. i. p. 596; Rich. & Swains. Faun. Bor.-Amer. ii. p. 419.

Distinguishable in the adult state by its entirely white plumage, yellow bill, and black legs. The two specimens here exhibited were taken in 1851, in Assistance Harbour, Barrow Straits, 74½° N. lat., 74¼° W. long., by Mr. Abernethy, ice-master to H.M.S. 'Felix.'

Case 37. WESTERN GULL.

Larus occidentalis, Audubon, Orn. Biog. v. p. 320; Baird, Birds N. Amer. p. 845.

One, killed on Choris Peninsula, Behring's Straits, in 1849, by Captain Moore, H.M.S. 'Plover.'

This species, of which the habitat is the north-west coast of America, is equal in size to *Larus argentatus*, but has a shorter wing, and is distinguishable by its much darker mantle.

Case 38. GLAUCOUS GULL.

Larus glaucus, Brünnich, Orn. Bor. p. 44; Rich. & Swains. Faun. Bor.-Amer. ii. p. 416; Baird, Birds N. Amer. p. 842.

Shot by Sir Leopold M'Clintock on Melville Island.

Individuals of this arctic species vary considerably in size. The young have the upper portion of the plumage yellowish white, mottled with pale brown; the underparts grey; the tail white, irregularly spotted with pale brown; bill yellow with tip horn-colour. It is in this plumage usually that we find the examples which are procured in Great Britain.

Case 39. SABINE'S GULL.

Larus sabinii, Sabine, Trans. Linn. Soc. xii. p. 520, pl. 29 (1818); Greenl. Birds, p. 551. no. 23; Richardson, Append. Parry's Second Voy. p. 360; Richards. & Swains. Faun. Bor.-Amer. p. 428.

Specimens of this bird in summer plumage are very rare in collections. The species was discovered by Capt. Sabine at its breeding-station on some low rocky islands off the coast of Greenland. He subsequently procured a pair at Spitzbergen. It was found in Prince Regent's Inlet during Sir Edward Parry's first voyage; and during his second voyage several specimens were obtained on Melville Peninsula.

Of late years young birds of this species have occasionally been met with on our own shores. It may be readily distinguished at all seasons by its forked tail, which in the adult is entirely white; in the young banded at the extremity with black. The adult bird in summer has the head and upper part of the throat blackish grey, terminated by a velvet-black collar. The bill is black, with the tip yellow. Legs and feet black.

The present case contains a remarkably fine pair in full summer plumage, obtained by Capt. Collinson on the north coast of America, probably in Fox-Channel, during a cruise in H.M.S. 'Enterprise' between the years 1851–1854.

Case 40. Richardson's Skua.

Lestris parasiticus, Linn. Syst. Nat. i. p. 226.

Lestris richardsonii, Swainson, Faun. Bor.-Amer. ii. p. 433, pl. lxxiii.

Two specimens, of which no particulars have been preserved.

Case 41. Buffon's Skua.

Lestris buffonii, Boie, Isis, 1822, p. 562.

Lestris parasitica, Rich. & Swains. Faun. Bor.-Amer. ii. p. 430.

Two, procured by Captain Collinson, in the 'Enterprise,' 1851–1854.

The habitat usually assigned to this species is the Arctic sea-coasts of Europe and America. Some interesting remarks on its nesting-habits will be found in Wheelwright's 'Spring and Summer in Lapland,' pp. 355–359. He found it breeding in some numbers on the Quickjock Fells, laying, as a rule, but two eggs, and feeding the young exclusively on crowberries (*Empetrum nigrum*).

The principal food of the old birds, in addition to the crowberry, he found to consist of beetles and small Crustacea. "I cannot hear of their breeding further south," he adds, "than Peleekaisin, perhaps one hundred miles south of Quickjock."

Case 42. Arctic Tern.

Sterna macroura, Naumann, Isis, 1819, p. 1847.

Sterna arctica, Temminck, Man. d'Orn. ii. p. 742 (1820).

Two procured in lat. 75° 30′ N., long. 64° W., by Capt. Collinson, C.B., in H.M.S. 'Enterprise,' betwen 1850 and 1854.

Case 43. Fulmar Petrel.

Procellaria glacialis, Linn. Syst. Nat. i. p. 213.

The locality whence the single specimen in this case was procured has not been noted. The species abounds in the North-Atlantic Ocean, and in the larger bays and straits. It is a constant attendant upon the whalers, assembling in large numbers when a Whale is being cut up, and is so greedy and fearless on these occasions as frequently to approach within a few yards of the sailors.

3. On Birds from the Galapagos Islands.

By Professor CARL J. SUNDEVALL, F.M.Z.S.

[Received January 16th, 1871.]

In May 1852, the Swedish Frigate 'Eugenie' (Commander Virgin), on its voyage round the world, visited the Galapagos Islands, chiefly for the purpose of making scientific observations and collections. Nine days elapsed from its coming to its departure; but of these, two whole days were lost, owing to the vessel being becalmed in the offing. The frigate called successively at the islands of Chatham, Charles, and James; and, in addition, the naturalists attached to the expedition made an excursion in one of the boats to Albemarle and Indefatigable Islands.

Notwithstanding the very wet weather, the collections made were considerable, the naturalists being kindly assisted, here as in every other part of the voyage, by the Commander and all the officers, and even by the crew.

Dr. Kinberg, the zoologist and surgeon of the expedition, took the trouble to determine, or have determined by others, the sex of almost every specimen of the birds, and to attach to it the name of the island on which it was found.

The voyage has been described by Lieutenant Skogman, in two volumes, large 8vo, with charts and illustrations (Stockholm, 1854), and by Mr. Anderson, botanist to the Expedition, in three volumes, small 8vo (also published in 1854).

The following is the list of the birds brought home. Most of the species are mentioned by Darwin in the 'Zoology of the Beagle—Birds,' 1841, and described there, or in this Society's 'Proceedings,' by Gould: these references, therefore, need not be quoted. Only nos. 15 and 24 are supposed to be new. Those which are new to the archipelago have a † prefixed: these are mostly water-birds, and probably only make a short stay there during the winter or for breeding. The following abbreviations are used to denote the islands on which the land-birds were taken:—Chm., Chatham; Ch., Charles; J., James; Alb., Albemarle; and Ind., Indefatigable.

1. MIMUS MELANOTIS (Gould). Chm., Ch., J., Ind.

Conf. Obs. A.

2. DENDRŒCA PETECHIA, L., var. Chm., Ch., J.

Sylvia aureola, Gould, Darw.

Descripta in Consp. Generis *Dendrœcæ*, Vet. Ak. Œfv. 1869, p. 608.

3. CACTORNIS SCANDENS, Gould. Ch., J.

4. GEOSPIZA STRENUA, Gould. J.

5. G. FORTIS, Gould. Ch., J.

6. G. NEBULOSA, Gould. Chm., Ch.

7. G. FULIGINOSA, Gould. Ch., J.

8. G. PARVULA, Gould. Chm.

†9. CAMARHYNCHUS PROSTHEMELAS, Scl. et Salv. P. Z. S. 1870, p. 325. Chm., Ch., J.

Camarhynchus, sp. inc., nob. in litt. et commerciis.
Tantum feminæ et juniores allatæ; nullus niger.

10. HIRUNDO MODESTA. J.

Hirundo concolor, Gould, P. Z. S. 1837, p. 22.
Progne modesta, Gould, Darw. Voy. Beagle, Birds, p. 39.
Forma simillima *H. purpureæ*, L., sed multo minor.

11. PYROCEPHALUS NANUS, Gould. J., Ind.

12. MYIARCHUS MAGNIROSTRIS, Scl. et Salv. Ch., J.

Myiobius magnirostris (Gould), Darwin, Beagle, Birds, 48.
Vide Obs. B.

13. COLUMBA (ZENAIDA) GALAPAGENSIS, Gould. J.

14. BUTEO GALAPAGENSIS.

Polyborus galapagensis, Gould, 1857.
Craxirex! *galapagensis*, Gould, Beagle, pl. 2.
Vide Obs. C.

15. ARDEA PLUMBEA, n. sp. J.

Vide Obs. D.

16. ARDEA VIOLACEA, L. (var.?).

Vide Obs. E.

†17. HÆMATOPUS PALLIATUS.

18. ANOUS STOLIDUS (L.). Frequens.

19. LARUS FULIGINOSUS, Gould, Darw. Ch., Ind.

20. TACHYPETES AQUILUS (L.).

†21. PELECANUS FUSCUS, L.; Schlegel, Mus. P.-B.

Vide Obs. F.

†22. DYSPORUS CYANOPS, Sundev. Physiogr. Tidskr. Lund, 1837; Ann. and Mag. N. Hist. 1846, vol. xvii.

†23. DYSPORUS LEUCOGASTER (Bodd.).

D. fuscus (Vieill. Gal.).

24. Spheniscus mendiculus, n. sp. J.
Vide Obs. G.

25. Anas bahamensis, L.

†26. A. maculirostris, Licht.

Observationes.

A. *Mimus melanotis.* Specimina numerosa hujus unius speciei allatæ, multum quidem inter se differunt et a *Mimis* a Darwinio et Gouldio descriptis distincti viderentur; differentiæ vero non nisi varietates ætatis, sexus et tempestatis anni exhibent. Omnia Maio, brevi ante mutationem plumarum, occisa sunt. Ptilosis igitur seniorum valde trita et sordida, marginibus tectricum et apicibus rectricum laceris, nec nisi partim relictis.

Mas senior superne fusco-griseus, cervice non pallidiore; maculis pilei anterioris, in basi plumarum, fuscis, parvis, obsoletis; dorsi nullis. Subtus totus sordide albus, gutture inferiore pectoreque anteriore (saltem lateribus) fusco-griseo lavatis (non maculatis). Latera ventris striolis angustis nigris notata. Supercilia obsoletiora, albida. Plumæ lori et postoculares (plagam auris magnam formantes) fuscescentes, apicem versus decolores, interdum fere albidæ. Striola submalaris fusca. Alæ fuscæ, marginibus tectricum latis albis (nunc fere detritis). Remiges apice latius albido marginati. Rectrices fuscæ; laterales, utrinque 4, apice, in pogonio interno longius albidæ: plaga in penna extima circa 18 millim., in reliquis sensim breviore. Rostrum et pedes nigricantia.

Longit. tota circa 230 millim.; rostrum a fr. 26; ang. 32; ala 120; c. 110; t. 37.

Fem. senior similis mari; differt maculis dorsi magnis, fuscioribus; striolis laterum et stria malari latis, maculas oblongas fuscas exhibentibus. Paulo minor: r. 24 (30) millim.; ala 107; c. 105; t. 35; partes vero omnes, ut in mare, variabiles, paulo majores vel minores.

Junior, habitu *primo* vestitus, superne fuscus, pileo nigriore, cervice cum lateribus colli cinerascenti-pallidis. Plumæ dorsi fuscæ grisescente marginatæ, unde dorsum fusco maculatum. Subtus purius albus, jugulo toto pectoreque anteriore crebrius nigro maculatis: maculis parvis, triangularibus. Latera ventris parce fusco maculata. Supercilia minus evidentia, pallescentia. Lora et macula magna postocularis nigra. Alæ nigræ, tectricibus parvis griseo-albido marginatis; mediis et magnis late, pure albo marginatis, fascias 2 formantibus. Remiges extus pallido, apice latius albo marginati. Rectrices, utrinque 4, apice longius albæ (plaga in pog. int. extimæ pollicari, in pog. ext. brevi). ♂ r. 22 (28) millim.; ala 112; c. 114; t. 38. Alius (an ♀?), r. fr. 22; ala 100; t. 33. *Juniores* omnes (forte Martio vel Aprili nati) habitu *vix trito* vestiti, quem jam deponere cœperunt quidam; plumæ enim novæ erumpunt, colorem seniorum exhibentes; quod præsertim in lateribus pectoris antici apparet, ubi plumæ novæ, griseæ, inter albas, juveniles, observantur.

Specimina a Darwinio allata (Octobri occisa), habitu recentiore, non trito vestita. Macula auricularis sicut in junioribus nigro-fusca; nondum tritura et luce decolorata.

Præter hanc *Mimi* speciem duæ aliæ, parum distinctæ, ex his insulis a Darwinio allatæ, describuntur:

M. trifasciatus Gould, Darw., simillimus *M. melanoti*, sed major (ala 5 poll. Angl. = 126 millim.). Regio auris alba, absque macula nigricante; tectrices alarum parvæ etiam albo marginatæ, unde fasciæ 3 numeratæ. Cauda paullo longior quam ala dicitur ($5\frac{1}{2}$ poll.), quod vero in icone non apparet.

M. parvulus Gould, Darw. *Mimo melanoti* adhuc similior, macula auris nigra et fasciis alæ tantum 2 albis notatus, vix nisi magnitudine paullo minore differre videtur (ala $3\frac{5}{8}$ poll. = 92 millim.). Rectrices hujus, ut omnium, nimis breviter descriptæ.

Harum sp. prior tantum insulam Charles inhabitare dicitur, unde eam solam (nec 2 reliquas) accepit Darwin. Nobis tamen, ex illa insula nullum specimen hujus, sed unum *M. melanotis* allatum est.—*M. parvulus* tantum in insula Albemarle inventus est, unde *Mimum* nullum retulit navis Suecana. Inopinatum sane videtur, formas tres tam affines, insulas tam vicinas et ejusdem naturæ inhabitare. Sed ut scientiam nostram debito modo illustret res memorabilis, denuo in loco examinanda videtur, vel saltem specimina allata diligentius comparanda. Haud enim absonum videtur aves, quæ distinctæ habentur, nil esse nisi specimina paullum insolite formata ejusdem speciei. Sic *M. trifasciatus* forte inveniretur mas vetus, solito paullo major, plumis auris et tectricibus parvis radiis solis, vel ipsa ætate avis decoloratis. Alter vero, *M. parvulus*, simillimus videtur juveni hornotino, habitu novo nuper accepto, alis nondum satis adultis.

B. *Myiarchus magnirostris*, omni forma et colore simillimus *Myiarcho feroci* (L.); sed parvus, quasi specimen hujus avis pygmæum, vel per vitrum minuens visum. Quod bene observarunt Sclater et Salvin, nomine generico debito, in P. Z. S. 1870, p. 323, imponendo. Cauda tamen, ratione corporis, paullo brevior et minus rotundata.

C. *Buteo galapagensis*, etsi vitæ ratione et habitu quodam degenerato forte similis *Polyboris*, minime tamen illo generi affinis. Re vera inter accipitres buteoninos numerandus; qui, vel genus unum, magnum satisque polymorphum haberi possunt, vel in genera multa, parva distribuendi sunt. Hæc vero species, si generice separatur, *Pœcilopternis* Kp. dicendum; nomen enim alterum, "*Craxirex*," unicuique linguarum paullum perito detestabile.

D. *Ardea plumbea*, n. sp., affinis *A. scapulari* et præsertim *A. rufiventri*. Fusco-cinerea, unicolor, vitta gastræi indefinita, dilutiore (cinerea), a rostro ad anum ducta. Plumæ basi pallidiores. Alæ extus (in tectricibus pennisque cubiti) leviter virenti-æneæ, absque marginibus pallidis; margines enim tectricum remigumque potius paullo fusciores. Remiges primarii nigro-cinerei, cano micantes. Plumæ dorsi (ut in *A. scapulari* etc.) longæ, angustæ, acutæ, margine definitæ; basi nigriores, viridi-æneseentes; medio apiceque cinerascentes, rhachide tenuissima, pallida. Caput et cervix nigricantia, levissime ænescentia. Rostrum (siccatum) nigricans, subtus angustius pallescens; pedes (sicci) fuscescentes.

Rostr. a fr. 68, altit. 15, ala 175, tars. 50 millim. ♂?
,, 67 ,, 15, ,, 165, ,, 47 ,, ?

Partes omnes ut in *A. scapulari* ejusque variet. Africana et Indica formatæ; tibia solummodo brevius nuda (circa 20 millim.); sed rostrum pro mole crassius. Crista occipitis nulla definita: plumæ ibi laceræ, ut in cervice.

Specimina 3 ex insula James allata.

E. *Ardea violacea* L. (varietas?). Specimen unicum allatum, sexus incerti, ab illis ex continenti Americana differre videtur colore ubique obscuriore, præsertim in collo ventreque fusciore, plagaque nigra, 25–30 millim. longa, in medio pogonii externi remigum 1–5. Specimen hoc fere adultum videtur; forte in initio anni tertii occisum? Caput ut in senioribus americanis pictum, sed albedo verticis minor et crista adhuc imperfecta. Striolæ albidæ juveniles ubique deperditæ; tarsus nulla parte tumidus. Plumæ dorsi angustæ, elongatæ; quædam longissimæ et valde fimbriatæ, ut in *A. violacea* seniore; sed sordide nigro-fuscæ, margine latiusculo, sat distincto, pallidius fusco (nec, ut seniorum, cano vel læte cærulescente). Alarum tectrices minores: multæ similes plumis dorsi; aliæ, ut tectrices majores et pennæ cubiti, sordidius fuscæ, vix vel tenuissime et obsoletius pallidimarginatæ. Pennæ cubiti apice fusco-canescentes; primariæ lætius canescentes; 1–5 plaga pogonii externi medii nigra ornatæ, qualem in nulla alia *A. violacea*, seniore vel juniore, vidi. Magnitudo in hac specie media; rostrum vero inter minus crassa numerandum. R. a fr. 70, alt. 21, ala 270, t. 83 millim.

Specimina *Ardeæ violaceæ* numerosa, variæ ætatis, ex diversis Americæ partibus habemus; ex quibus hæc colligere posse credimus:

Juvenis, habitu primo (plus quam unum annum subsistente) vestitus: totus fuscus, creberrime albido maculatus, pictura omni simillimus juveni *A. nycticoracis*, neque ab eo dignoscitur nisi rostro crassiore et tarso longiore. Tarsus in juv., ad volandum apto, digito medio cum ungue longior, 80 millim. explet vel excedit. (In *A. nycticorace*, etiam seniore, raro 70 millim. excedit: plerumque brevior; semper digito m. c. u. brevior.) Plumæ omnes fuscæ, stria media lata, apice latiore, initio albido-fulva, dein pallidiore, tandem alba, notatæ.

Habitus secundus ubique obscure fuscus, striolis albidis multo angustioribus: in capite colloque filiformibus; in alis filiformibus, apice dilatatis; in gutture ventreque latioribus; in dorso nullis, vel tantum vestigiis paucis, minimis. Plumæ elongatæ, lineares, nigræ, griseo marginatæ, in dorso erumpere cœperunt. Rostrum et pedes perfectiora.

Habitus tertius (dum completus) pictura omni exacte ut in avi vetere distributa, sed color ubique sordidior, fuscior (fere ut in avi Galapagensi). Collum et venter sordide fusco-grisea. Plumæ omnes dorsi et alarum nigro-fuscæ, limbo latiusculo pallidiore, fusco-griseo (pro læte cærulescenti-cano seniorum). Specimina ejusmodi ex Brasilia et Callao habemus.

Habitus perfectus seniorum, ♂ et ♀, pulchre læteque cærulescenti-canus, nigro varius, capite pure albo nigroque picto. Incertum quo modo oriatur iste habitus, an sola mutatione coloris a fusco sordido ad purum lætumque, vel plumis fuscis depositis novoque habitu renato, qui quartus numerandus esset?

Hæc avis magnitudine sat variabilis:

		Rostr.			
		long. a fr.	altit.	Ala.	Tars.
Vetus, sexu ign. . .	Am. sept. . .	70	22	300	95
Bienn. sexu ign. . .	Callao	75	23	283	93
Bienn. ♀	India occ. . .	73	18	280	92
Bienn.	Brasil.	75	25	260	75
Vetus	Guiana?	72	24	230	80

Sed, ut ad avem nostram galapagensem revertamur, incertum videtur an specifice differat. Etiam suspicari licet eam veram esse *A. violaceam*, in statu, inter habitus descriptos secundum et tertium medio, occisam: plumis albido striatis omnibus depositis, ala vero extus plumis intermediis, mox iterum deciduis, totis fuscis, tecta, inter quas plumæ elongatæ, griseo marginatæ, erumpere cœperunt. Nota tamen descripta, nigra remigum 1–5. peculiaris et color fuscus, præsertim gutturis ventrisque, paullo obscurior quam in habitu tertio descripto videtur.

F. *Pelecanus fuscus* L. frequens fuisse videtur; 7 specimina allata, in quibus magna et parva (rostro 370, 310, 280 millim.), cervice alba, nigra, fusca; nullum cristatum.

G. *Spheniscus mendiculus*, n. sp. affinis *S. demerso*, sed statura parva, rostro longiore, maxilla inferiore lutea, apice nigra, pictura gulæ etc. distinctus. Long. tot. ♂ 500, ♀ 450 millim.

Niger, subtus albus. Capitis latera cum gula nigro-fusca, mento albo. Linea superciliaris angusta, alba, a macula lori majore incepta, aurem cingens, in jugulo supremo cum pari conjuncta. Cervix et colli latera nigricantia. Color nigricans jugulum ambit ibique torquem format, albedinem juguli in fascias duas separantem. Linea infra-lateralis nigra (ut in *S. demerso*) linea laterali interjecta alba a nigredine dorsali separata, et in jugulo medio cum pari arcuatim conjuncta. Ala subtus nigra, cum vitta longitudinali, minus definita, albida, in carpo abbreviata. Rostrum nigrum, maxilla inferiore lutea (vel aurantiaca), apice ante nares nigra, limite definito. Pedes (sicci) fusci.

Ut in *S. demerso*, maxilla inferior apice truncata, et superior basi crebre plicato-striata:

	Rostri				
	long. a fr.	ab ang.	alt. basi.	Dig. m. c. u.	Pes totus (a talo).
♂	57^{mm}	70^{mm}	21^{mm}	64^{mm}	102^{mm}
♂	58	68	21	60	95
♀	55	69	18	57	90

Aves descriptæ, ad litora et circa insulas frequentes, etiam manibus captæ sunt. Plures deinde, vivæ in navi servatæ, delectamento erant nautis, erectæ, vacillando circumvagantes, speciem præbentes pueruli mendici, veste prolixa, terram verrente et manicis pendulis instructa, induti. (Hinc nomen petitum, etsi habitus idem *Spheniscinis* omnibus verisimiliter communis.)

4. On the Birds of Angola.

By R. B. SHARPE, F.L.S., Libr. Z.S., &c.—Part III.

[Received January 17, 1871.]

(Plate VII.)

Since my previous papers on the avifauna of Angola I have only received two collections, neither of them very extensive. The first was placed in my hands by my friend Mr. J. J. Monteiro, who brought a few birds with him on his recent return to England on account of his ill-health. I am happy to say that he has now completely recovered and has gone back to Angola; so that we may expect to have from him some more observations on the ornithology of that country, to the elucidation of the fauna of which he has contributed in so remarkable a manner.

For the second collection I am indebted to Mr. Cutter of Bloomsbury Street, who had received it, in his capacity as a natural-history agent, from Mr. Charles Hamilton, a gentleman now travelling in Angola. I have to thank Mr. F. G. H. Price, who is a personal friend of Mr. Hamilton, and who has aided him greatly in the objects of the expedition, for the following note, which has reference to the localities where the birds were collected:—

"Mr. Hamilton told me in a letter that he had killed most of his birds on the river Lucalla, and some near Cazengo. He informed me that birds were not plentiful, owing to the many enemies the young ones had. He likewise killed birds and caught butterflies in the vicinity of Galungo Alto."

Having in my last paper (P. Z. S. 1870, p. 142) forgotten to give the number of species, I must here state that up to the present time I have recorded sixty as having been sent by Mr. Monteiro and Heer Sala. It will be interesting in a little while to compare the results obtained by the English naturalists with those obtained by Signor Anchieta, who is making large collections in Angola for the Lisbon Museum, when we may hope to arrive at a correct knowledge of the avifauna of the country. I have, as usual, referred to Prof. Barboza du Bocage's papers on the consignments of Signor Anchieta, a dagger † being prefixed when the bird is believed to have been recorded from Angola for the first time.

61. CRINIGER FLAVIVENTRIS.

Criniger flaviventris (Sm.); Finsch, J. f. O. 1867, p. 22.

Trichophorus flaviventer, Sm.; Bocage, Jorn. Acad. Lisb. ii. p. 43.

One specimen shot by Mr. Monteiro. In size it is bigger than Damara specimens in my collection, the bill being very conspicuously larger and shorter. I fail, however, to detect the slightest difference in coloration.

62. PYCNONOTUS TRICOLOR. (Plate VII. fig. 2.)

Ixus tricolor, Hartl. Ibis, 1862, p. 341; Bocage, Jorn. Acad. Lisb. i. p. 137.

Mr. Hamilton has sent three specimens of this bird, which was originally discovered by Mr. Monteiro in Angola.

I take the present opportunity of making a few observations on the African species of the genus *Pycnonotus*, as their synonymy appears to me to be in a hopeless state of confusion at present; nor am I quite certain that all my own conclusions are satisfactory, notwithstanding that I am working with a very full complement of specimens before me. In their recent work on the birds of Eastern Africa, Drs. Finsch and Hartlaub give a summary of what they consider to be the representatives of the genus *Pycnonotus* in Africa, as follows:—

a. *With white under tail-coverts.*

1. *Pycnonotus obscurus* (Temm.).
2. *P. inornatus* (Fraser).
3. *P. ashanteus* (Bp.).
4. *P. arsinoë* (Licht.).

b. *With yellow under tail-coverts.*

5. *P. nigricans*, with which is associated *P. xanthopygos* (Hempr. et Ehr.).
6. *P. tricolor* (Hartl.).
7. *P. capensis* (Linn.).

In the first of these groups I recognize only two species (*P. obscurus* and *P. arsinoë*); and in the second group I admit five species, as follows:—(1) *P. gabonensis* (sp. n.), (2) *P. xanthopygius*, (3) *P. nigricans*, (4) *P. tricolor*, and (5) *P. capensis*.

In the first place, the authority for *P. ashanteus* is Prince Bonaparte, who states in his diagnosis that it is exactly similar to *P. obscurus* of Algeria, but is smaller. All I can say is that I fail to discover the slightest specific distinction, and measurements will show how little worth are the differences in size.

I am indebted to the kindness of Mr. T. C. Eyton for the loan of Fraser's type specimen of *P. inornatus*; which I find to be certainly the same as *P. obscurus*. It appears to be a young bird, being suffused with brown on the breast, though this is not a specific character, as any one acquainted with the variations in plumage of the *Pycnonoti* will readily admit. The range of *P. obscurus* may be stated to be Algeria and Western Africa, from Senegambia to Fantee. It has been recorded (s. n. *Ixus ashanteus*) from Angola; but this extended range requires confirmation, for it is perhaps the Gaboon species which supplies the place of *P. obscurus* from Cameroons southward. The *Bulbul* from Gaboon is certainly a distinct species, and may be described as

Pycnonotus gabonensis, sp. n. (Plate VII. fig. 1.)

P. *similis* P. barbato, *sed saturatior et crisso albo, flavo clare lavato.*

I have no doubt that this is the bird sometimes called *P. ashanteus* by authors, as distinguished from *P. inornatus*, by reason of the yellow tint on the vent and under tail-coverts; but as yet no name has been assigned to the species, that I can find. It forms a clearly characterized link between the two sections of the genus, being closely allied to *P. barbatus* and *P. tricolor*.

The accompanying illustration (Plate VII.) represents the three species. It will be observed that *P. gabonensis* (fig. 1) is very similar to *P. barbatus* (fig. 3), but is darker in coloration, and has a slight tint of yellow on the under tail-coverts; these latter are entirely bright yellow in *P. tricolor* (fig. 2).

It must be remembered that the *P. nigricans* of Vieillot is founded on the *Brunoir* of Le Vaillant (pl. 106. fig. 1), and this species is represented with a *red eyelid*. It would therefore be wrong to join *P. xanthopygius*, which has no red eyelid, with *P. nigricans*, even if the clearly defined black cap and paler coloration were not sufficient to separate the first-mentioned bird. The true *P. nigricans* I have in my collection from Damara Land, Transvaal, and Natal; and Mr. Layard has received it from Dr. Exton, from Kanye in Mosilikatze's country. In addition to the red eyelid, *P. nigricans* has a somewhat mottled appearance on the breast, this being produced by the edges of the feathers being much paler than their bases.

P. tricolor is a very variable species, changing both with age and with locality, and presenting very different states of plumage in specimens collected at the same place on the same day of the year. Some of my specimens from Damara Land and Angola agree exactly with the type, with which I have compared them, while others from Graham's Town are so brown on the under surface of the body as to approach very near to *P. capensis*. The range of the species (which has been confused with *P. nigricans*) appears to extend from Angola through Damara Land and Natal to Graham's Town.

P. capensis is generally to be recognized by its brown tint of plumage, which extends all over the lower surface of the body. Its range is limited, apparently being confined to the Cape Colony. There are two distinct races of the species, a large and a small form, differing in size, as will be seen below.

	Long. tot.	alæ.	tarsi.
1. South Africa (*Layard*)	8·2	3·8	0·85
2. South Africa (*Mus. T. C. Eyton*) ..	6·8	3·6	0·8
3. George (*H. Atmore*)	6·9	3·55	0·8

†62. NECTARINIA CHLOROPYGIA.

Nectarinia chloropygia, Jard.; Hartl. Orn. Westafr. p. 47.

A pair sent by Mr. Hamilton.

†63. NECTARINIA CYANOLÆMA.

Nectarinia cyanolæma, Jard.; Hartl. Orn. Westafr. p. 51.

A pair of this Sunbird are sent by Mr. Hamilton.

†64. NECTARINIA SUPERBA.

Nectarinia superba (Vieill.); Hartl. Orn. Westafr. p. 45.

Two males are in Mr. Hamilton's collection.

65. TERPSIPHONE VIRIDIS.

Tchitrea viridis (Müll.); Gray, Hand-l. of B. i. p. 332.
Tchitrea cristata (Gm.); Bocage, Jorn. Lisb. 1870, p. 343.

One specimen in Mr. Hamilton's collection.

†66. PLATYSTEIRA LEUCOPYGIALIS.

Platysteira leucopygialis, Fras.; Hartl. Orn. Westafr. p. 95.

One specimen forwarded by Mr. Hamilton.

†67. NIGRITA CANICAPILLA.

Nigrita canicapilla, Strickl.; Hartl. Orn. Westafr. p. 130.

Mr. Hamilton has sent a single specimen of this bird; and a careful examination proves conclusively that *N. emiliæ*, of the specific difference of which I had begun to have some doubts, is certainly another species, the characters being correctly given by me in the original description (Ibis, 1869, p. 384).

†68. HYPOCHERA NIGERRIMA, sp. n.

H. *similis* H. nitenti, *sed major: omnino nigra: alis et cauda brunneis: margine carpali et hypochondriis albidis: rostro albescenti-rubido: pedibus brunneis. Long. tot.* 4·2, *alæ* 2·6, *caudæ* 1·4, *tarsi* 0·6 *poll. Angl.*

One specimen of this apparently new species of *Hypochera* has been sent by Mr. Hamilton. M. Jules Verreaux agrees with me that it is distinct from *H. nitens*, and approaches more closely his *Vidua hypocherina*, exhibiting an additional proof of the affinities of the two genera *Vidua* and *Hypochera*. Compared with *H. nitens*, the new species is distinguished by its larger size and totally black coloration. *H. nitens* measures as follows:—Long tot. 3·8, alæ 2·35, caudæ 1·35, tarsi 0·5.

69. DILOPHUS CARUNCULATUS.

Dilophus carunculatus (Gm.); Mont. P. Z. S. 1865, p. 93.

Several specimens in Mr. Monteiro's collection obtained by Heer Sala. They were all procured at Galungo in August 1869.

†70. ACCIPITER MINULLUS.

Accipiter minullus (Daud.); Hartl. Orn. Westafr. p. 16.

A specimen marked by Sala female, but which appears to Mr. Gurney and myself to be a young male, from Galungo, Loanda, August 15th, 1869.

†71. BUCEROS FISTULATOR.

Buceros fistulator, Cass.; Hartl. Orn. Westafr. p. 162.

Mr. Hamilton has sent one specimen of this fine Hornbill, which does not seem to have been previously recorded from Angola.

72. TROGON NARINA.

Trogon narina, Vieill.; Mont. P. Z. S. 1865, p. 92; Bocage, Jorn. Lisb. 1868, p. 39.

One female in Mr. Hamilton's collection.

73. TURACUS CRISTATUS.

Turacus giganteus, V.; Bocage, Jorn. Lisb. 1867, p. 142, et 1870, p. 347.

Two specimens are in Mr. Hamilton's collection.

74. CORYTHAIX ERYTHROLOPHOS.

Corythaix erythrolophos (V.); Bocage, Jorn. Lisb. 1867, p. 142, et 1870, p. 346.

Corythaix paulina (Temm.); Mont. Ibis, 1862, p. 338.

Two specimens forwarded by Mr. Hamilton.

†75. MUSOPHAGA ROSSÆ.

Musophaga rossæ, Gould; Hartl. Orn. Westafr. p. 160.

Mr. Hamilton has sent one specimen of this bird, the exact habitat of which was previously unknown*.

76. SCHIZORHIS CONCOLOR.

Schizorhis concolor (Sm.); Mont. P. Z. S. 1865, p. 91; Bocage, Jorn. Acad. Lisb. 1868, pp. 49, 335, et 1870, p. 347.

A male from Galungo on the 9th of August, 1869, and a female from the same place on the 20th of September, both procured by Heer Sala.

77. DENDROBATES BRUCII.

Dendrobates brucii (Malh.); Bocage, Jorn. Acad. Lisb. ii. p. 45.

A female procured by Sala at Galungo on the 28th of September, 1869.

78. DENDROBATES NAMAQUUS.

Dendrobates namaquus (Licht.); Bocage, Jorn. Acad. Lisb. i. p. 336.

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* See *anteà*, p. 1.

A female collected by Sala at Galungo, Loanda, September 28th, 1869.

79. Dendrobates cardinalis.

Picus cardinalis, Gm.; Sund. Consp. Av. *Pic.* p. 43.
Picus flaviscapus, Ill.; Hartl. P. Z. S. 1865, p. 26.
Dendrobates flaviscapus, Ill.; Bocage, Jorn. Acad. Lisb. i. p. 336.

A female collected by Heer Sala at Galungo, Loanda, on the 18th of August, 1869.

80. Ardetta podiceps.

Ardetta podiceps (Bp.); Hartl. Orn. Westafr. p. 224.

One specimen brought home by Mr. Monteiro.

5. Description d'une Espèce nouvelle de *Promerops*.

Par Jules Verreaux, C.M.Z.S.

[Received January 10, 1871.]

(Plate VIII.)

Promerops gurneyi, sp. nov. (Plate VIII.)

Diagn. *Similis* P. capensi, *sed pileo et pectore rufo-castaneis distinguendus.*

Front et vertex roux châtain-clair; occiput, derrière du cou, manteau, dos et scapulaires d'un brun fortement nuancé de gris, et lanceolé au centre des plumes de flammèches noires plus ou moins larges, plus grandes sur le premier; de nombreux points blanchâtres terminent les plumes de l'occiput; le croupion et les sous-caudales olivâtres; ailes noirâtres, à rémiges frangées extérieurement de gris cendré; queue d'un gris plombé, avec la partie interne plus foncée, et presque noire; région parotique un peu plus brune que la partie supérieure du corps; menton et joues d'un blanc légèrement nuancé de fauve, cou et thorax roux châtain uniforme, devenant de plus en plus blanchâtre sur les ventre, laissant voir de longues flammèches brunes sur les flancs; région anale jaune, sous-caudales brunes bordées de blanchâtre.

Cette espèce, dont nous possédons depuis plusieurs années deux exemplaires dans notre collection, et à laquelle nous nous faisons un plaisir d'imposer le nom de *Promerops gurneyi*, nous avait été offerte par ce savant ami qui les avait reçus de Mr. Ayres. La bonne fortune qu'a eue notre ami, Mr. Sharpe, d'obtenir pour sa riche collection Africaine un magnifique exemplaire qu'il a bien voulu nous communiquer et nous permettre de décrire, nous ayant confirmé dans notre opinion, nous n'hésitons plus à livrer à la publicité cet oiseau, d'autant plus intéressant, qu'il forme la seconde espèce d'un genre resté si longtemps unique. Les différences principales sont surtout dans la coloration roux châtain qui couvre une partie de la tête, du

cou et du thorax, qui n'existe pas dans l'ancienne espèce dont le peu de roux qui se trouve mélangé au cou et à la poitrine est toujours d'une pâleur qui ne rapproche en rien de la vivacité de celle de notre nouvel oiseau ; et il en est de même pour la teinte grise de la partie supérieure que nous n'avons jamais vue aussi tranchée que dans celui de Natal.

Quoique les trois exemplaires que nous avons vus, n'aient pas la longue queue qui ne paraît qu'à la saison des amours, nous ne doutons pas qu'à cette époque notre oiseau n'en soit aussi pourvu, ce que viendront confirmer les naturalistes qui plus heureux que nous se trouveront à même d'en faire l'observation.

6. Description of *Platasterias*, a new Genus of *Astropectinidæ*, from Mexico. By Dr. J. E. Gray, F.R.S. &c.

[Received January 23, 1871.]

(Plate IX.)

Mr. A. Boucard has lately sent some reptiles and other animals from Tehuantepec in Mexico to the British Museum, among which is a specimen of a Starfish allied to the genus *Astropecten*, belonging to a form which I do not recollect to have been previously noticed, and evidently very different from any that I have ever before seen. It differs from *Astropecten* in being much flatter, more like a deeply divided *Palmipes*, without any marginal tessera and with a single row of marginal spines. It is peculiar in the rays being very broad near the base, and then contracted and separated from each other by deep fissures.

PLATASTERIAS.

Body much depressed, flat, divided into five flat rays, which are broad near the base and gradually tapering to the ends, suddenly narrowed near the body and separated by deep fissures ; the margins of the rays narrow, sharp-edged, with a single series of very close short depressed mobile spines. The dorsal surface covered with close transverse linear series of short papillæ, which are covered at the end with a number of very short spines or *paxillæ*. The under surface with a central longitudinal keel on each side parallel to the ambulacra, with close transverse series of linear ridges, each covered with a series of short close spines ; the ambulacra edged with a series of elongate tapering acute spines, and with a tuft of similar spines at the angles of the mouth between the ambulacra.

PLATASTERIAS LATIRADIATA, sp. nov. (Plate IX.)

Body yellow when dry ; the rays five, flat, twice and a half the length of the diameter of the body, broadly lanceolate. The basal quarter suddenly dilated to its greatest width and then gradually tapering to the end, the greatest width being two-fifths

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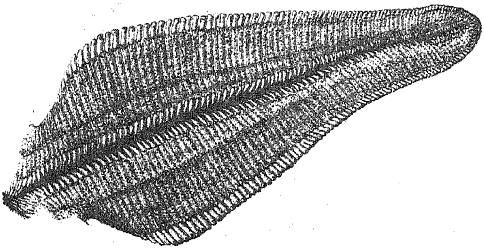

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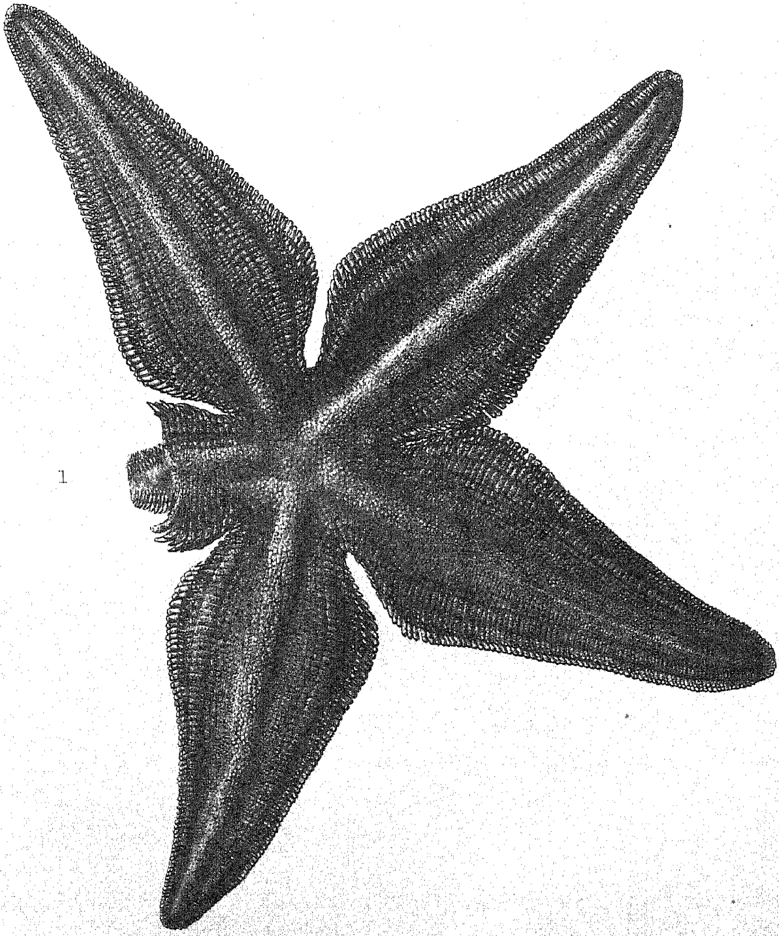

PLATASTERIAS LATIRADIATA.

of the entire length of the arm; the dorsal surface in the dry state concave on each side of the central prominent ridge, which is placed over the centre of the ambulacra.

Diameter 6 inches.

Hab. Mexico (Tehuantepec).

DESCRIPTION OF PLATE IX.

Fig. 1. Dorsal surface of *Platasterias latiradiata*, nat. size.
2. Under surface of one of the rays of *P. latiradiata*.

7. Description of a new Species of Pheasant of the Genus *Euplocamus* from Burmah, with a List of the known Species. By D. G. Elliot, F.L.S., F.Z.S., &c.

[Received January 24, 1871.]

Euplocamus andersoni, sp. nov.

E. *facie rubra: crista et corpore subtus indigoticis: dorso toto, alis et cauda grisescenti-albidis, illis longitudinaliter, hac transverse fasciatis: remigibus et rectricibus externe latius nigro transfasciatis: rostro pallide carneo.*

Entire upper parts greyish white, each feather having three or more black irregular lines running parallel to the edge, and meeting towards the end. Secondaries with broad transverse black lines. Top of head and lengthened crest, together with the entire underparts, deep rich blue. Tail long; middle feathers greyish white, thickly covered with transverse black lines; rest of tail-feathers similar, but the black lines broader. Bill pale green. Legs and feet greyish. Bare skin of face crimson. Size a little larger than *E. lineatus*.

I have taken the description of this apparently new form of *Euplocamus* from a native drawing of the bird copied from life, and kindly placed in my hands by Dr. Anderson, the Curator of the Indian Museum of Calcutta. The specimen was obtained in Burmah on the Chinese frontier, and is apparently an intermediate form between *E. lineatus* and *E. nycthemerus*. The *E. andersoni* differs from the *E. lineatus* in the markings of the upper parts, which are longitudinal, the feathers being entirely free from transverse markings or mottling; and may be distinguished from *E. nycthemerus* by the closely striated middle tail-feathers, the differently marked outer tail-feathers, the pale colour of the legs and feet, and the comparatively small size. There are no white central streaks to be seen upon the flank-feathers as in *E. lineatus*; but this is not of specific importance, as that character varies considerably among different individuals. The new bird can hardly be deemed a hybrid between the two species with which it has been compared, as their habitats do not join, and there is no appreciable way by which they might get together. The drawing was made from a living specimen in Dr. Anderson's possession, and as he has given orders for it to be killed and forwarded to London from Calcutta, we may expect before very long to be in possession of the skin.

It is with much pleasure that I bestow upon this species the name of its discoverer, the well-known naturalist, to record in this manner my appreciation of the courtesy which induced him to place the specimen in my hands for description.

No measurements were given in the drawing, which is much reduced from the natural size; but Dr. Anderson informs me that the bird is somewhat larger than the *E. lineatus*. Should the skin arrive safely, I shall figure it of the size of life in my 'Monograph of the *Phasianidæ*.' This makes the twelfth species of the genus *Euplocamus* now known to me; they are:—

1. EUPLOCAMUS ALBO-CRISTATUS.
Hab. Western Himalayas.

2. EUPLOCAMUS HORSFIELDI.
Hab. Assam and Sylhet.

3. EUPLOCAMUS MELANOTIS.
Hab. Sikhim.

4. EUPLOCAMUS NYCTHEMERUS.
Hab. Southern China, vicinity of Amoy.

5. EUPLOCAMUS ANDERSONI.
Hab. Upper Burmah, Chinese frontier.

6. EUPLOCAMUS LINEATUS.
Hab. Tenasserim, Pegu.

7. EUPLOCAMUS PRÆLATUS.
Hab. Siam, Shan States.

8. EUPLOCAMUS SWINHOII.
Hab. Island of Formosa.

9. EUPLOCAMUS IGNITUS.
Hab. Mergui, Tenasserim, Malayan peninsula, Sumatra.

10. EUPLOCAMUS NOBILIS.
Hab. Borneo.

11. EUPLOCAMUS ERYTHROPHTHALMUS.
Hab. Sumatra, Malacca.

12. EUPLOCAMUS PYRONOTUS.
Hab. Borneo.

8. On three new Species of Squirrels from Upper Burmah and the Kakhyen Hills, between Burmah and Yunan. By John Anderson, M.D., F.L.S., F.Z.S., &c., Director of the Imperial Museum, and Professor of Comparative Anatomy, Calcutta.

[Received February 7, 1871.]

(Plate X.)

Dr. Gray, in his "Synopsis of the Asiatic Squirrels in the collection of the British Museum"*, has adopted the genus *Macroxus* of F. Cuvier for all the Squirrels which he regards as having simple ears. He allows that the genus as originally instituted by F. Cuvier was very indistinctly characterized; but it does not appear to me that Dr. Gray has defined it any more clearly. The chief reason which induced him to adopt the genus was doubtless to separate the Squirrels with so-called simple ears from those which have pencilled or tufted ears. The character, however, that he has selected as a generic one does not merit that importance; for we find him placing *S. lokrioides* in the group of Squirrels with penicillated ears, while he places *S. similis* (which appears to be only a variety of *S. lokrioides*) and *S. lokriah*, and many other forms which have quite as much penicillated ears as the first, in the genus *Macroxus*. Any classification, moreover, which would separate generically such intimately allied forms as *S. macclellandi* and *S. palmarum*, surely must be essentially artificial; yet Dr. Gray arranges the former and *S. melanotis* in *Sciurus*, and *S. palmarum* in *Macroxus*. The same remarks apply with equal force to *Sciurus modestus*, Müller *apud* Gray (which, it is extremely probable, is only the young of *S. exilis*, Müller), and to *S. philippensis*, which Dr. Gray places in separate genera.

Until we have a more accurate knowledge of this difficult group, it appears to be premature to break up the natural genus *Sciurus*.

The following species were obtained by me on the Yunan expedition; and two of them belong to a new group of ventrally banded Squirrels.

Sciurus sladeni, n. sp.

Grizzled, rufous olive above, the annulations fine, and the fur of moderate length; the forehead, face, chin, throat, belly, inside of limbs, front of thighs, lower half of fore limbs, and the hind feet rich chestnut-red. Tail rather bushy, as long as the body without the neck and head, concolorous with the upper surface of the body, but slightly more rufous, with a bright chestnut-red tip.

Length from root of tail to tip of snout 10·25 inches, tail 6 inches, and to tip of rufous tuft 8·006 inches.

Skull: from anterior margin of occipital foramen to base of incisors 1·073; space between incisors and molars 0·051; distance (transverse) between first molars 0·030; breadth between orbits 0·077.

I obtained four specimens of this handsome Squirrel at Thizyain in

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* Ann. & Mag. Nat. Hist. 3rd series, vol. xx. p. 270 *et seq.*

Upper Burmah; and the Calcutta Museum has received two from the same district, where they were shot by Captain Williams. These six specimens are alike in all their details of colouring.

Belly-banded Squirrels.

SCIURUS GORDONI, n. sp.

Upper surface and a narrow line from between the fore limbs, along the middle of the body, grizzled olive-grey, the upper surface with a more or less rufous tint; annulations fine. Fur of moderate length. Chin and sides of the throat paler grizzled than the back; the lower part of the throat, the chest, belly, and inside of the limbs either rich chestnut or pale reddish yellow. Ears feebly pencilled. Tail as long as the body and neck, concolorous with the back, and more or less interruptedly ringed with rufous and black, the rings most distinct on the latter fourth.

A more or less marked apical tuft tipped with rufous.

Length from root of tail to snout 9·026, tail 7 inches.

Skull: from anterior margin of occipital foramen to base of incisors 1·053; interval between molars and incisors 0·048; distance between (transverse) front molars 0·025; breadth between orbits 0·067.

This Squirrel occurs among the rather dense vegetation within the stockade at Bhamó. I obtained only two specimens; and, as the above description indicates, the colour of the lower parts is the subject of considerable variation, it being light reddish yellow in one and rich chestnut in the other. In the former the grizzled line along the centre of the belly is much darker than in the latter, in which it is concolorous with the back. The one with the brightly coloured ventral surface is a female with enlarged teats, indicating that she recently had, or was with young at the time of her death in the month of February. The pale variety was procured in September. They are both adults; and it is probable that the difference in their hues is to be ascribed to seasonal changes dependent on sexual causes. Raffles, in writing of *S. affinis* (*S. bicolor*), states that it appears to vary considerably at different seasons, and suggests that these may coincide with the rutting-time. He describes it as changing to a light brown and even to a dusky yellow; and it is interesting to observe that, as in *S. gordoni*, Raffles's most intensely coloured individuals of *S. bicolor* were procured in February, and the lighter ones five months afterwards. Against these facts, however, Raffles mentions that a specimen he had in his possession for ten months did not change colour. Much importance, however, cannot be attached to observations of the latter kind, because it is impossible to say what may not be the influence which confinement exercises on these animals, more especially on the activity of their generative organs. The intimate connexion that exists between the sexual organs in certain animals and changes in the colours of their integumentary appendages is an undoubted fact; and it is equally certain that in the majority of feral animals they lie more or less dormant in confinement, so that the class of facts analogous to that just quoted from Raffles will throw little or no light on this interesting inquiry. In connexion with this subject it should also be borne in mind that the coloration of the young of some species of Squirrel is very different from that of their parents, so that we must first eliminate all the changes which are due to this cause before we can determine to what extent the variations of colour in this obscure group are influenced by the rutting-period or in any way affected by it. If we are ever to arrive at a correct understanding of the causes which produce the periodic variations of colour which we cannot but allow do occur among the most puzzling group of rodents, it will be only by painstaking observation of the species in their native forests and by the accurate recording of the phenomena as they appear. I would appeal to all naturalists in India, Burmah, and the Malayan peninsula, who have the opportunity, to give this neglected group a little of their attention; and I would suggest that the first step should be to ascertain how many well-marked species occur in a district, and second to observe if the sexes are alike in colour, and to note the changes, if any, to which they are subject, verifying each by a series of specimens of both sexes shot throughout the year. It seems very probable that as our knowledge of this group advances, the present number of Southern Asiatic forms will be greatly reduced.

S. gordoni belongs to what appears to be a distinct group of Squirrels, distinguished from the rest of the genus by grizzled or plain lineation of different colours of the ventral aspect. Blyth's species, *S. griseopectus*, was the first which showed this peculiarity of ventral lineation. He describes it as having "the throat and breast, and the median line of the belly, of a deep grizzled ash-colour, without a tinge of rufous, and much of the same hue as the crown and exterior of the limbs and feet." The locality of this Squirrel was unknown to him; but there are two specimens in the British Museum from China correctly referred to it by Dr. Gray, who, however, in his Synopsis of the Asiastic Squirrels, makes no reference to the mesial lineation of the belly, which is well marked in the specimens from which his description is taken.

The Squirrel which I have next to describe has no less than five distinct stripes along the belly; and it is probable that future research will not furnish a more intensely ventrally lineated form than it, although it is likely that the gap that exists between *S. griseopectus* and *S. gordoni* and this five-lined form, *S. quinquestriatus*, will be filled up by species having three and four ventral lines.

The lineated grizzled Squirrels of Southern and Eastern Asia may now be referred to three distinct groups,—the first, the dorsally lineated forms, illustrated by such species as *S. palmarum*, *S. berdmorii*, *S. penicillatus*, *S. sublineatus*, *S. layardii*, *S. macclellandi*, and *S. insignis*; the second, the laterally lineated Squirrels, including *S. rafflesii*, *S. sarawakensis*, *S. rufogularis*, *S. rufoniger*, *S. atricapillus*, *S. vittatus*, *S. nigrovittatus*, and *S. plantani*; and the third, the ventrally lineated forms, *S. griseopectus*, *S. gordoni*, and *S. quinquestriatus*.

The dorsally lineated Squirrels through *S. macclellandi* are connected with the aberrant form, *S. melanotis*, which is characterized by the banding of the sides of the head.

SCIURUS QUINQUESTRIATUS, n. sp. (Plate X.)

Above grizzled olive, brownish grey, with a distinct rufous tint, deepest on the dorsal surface; annulation fine, as in the grizzled Squirrels generally; chin and throat obscurely grizzled greyish, washed with reddish; a rufous grizzled blackish-brown band from the chest along the middle line of the belly to the vent; external to this, on either side, a broad pure-white well-defined band from the side of the chest, along the belly, and prolonged along the inguinal region to the vent; a broad black band from the hollow of the axilla along the side of the belly, expanding on the inside of the thighs, where it is faintly washed with greyish; inside of the fore limbs blackish, washed with greyish; toes black, with rufous annulations. Tail nearly as long as the body and head, concolorous with the body, but the black and rufous annulations much broader and more marked, assuming the form of indistinct rufous and black rings on the posterior third; tip of tail jet-black, narrowly terminated with greyish.

Length from root of tail to snout 9·039; length of tail 7·075; skull, from anterior margin of occipital foramen to base of incisors, 1·062; interval between first molar and incisors 1·050; transverse distance between first molars 0·076; breadth between orbits 0·076.

This is a hill species, common at Ponsee, on the Kakhyen range of hills, east of Bhamò, at an elevation of from 2000 to 3000 feet.

9. Description of a new Cetacean from the Irrawaddy River, Burmah. By JOHN ANDERSON, M.D., F.L.S., F.Z.S., &c., Director of the Imperial Museum, and Professor of Comparative Anatomy, Medical College, Calcutta.

[Received February 7, 1871.]

DELPHINIDÆ.

ORCELLA *.

Orcaella, Gray, Cat. Seals and Whales Brit. Mus. 1866, p. 285.

Head round, globular, slightly pointed when viewed from above; forehead full, projecting a little beyond the mouth; blow-hole transversely crescentic, convex posteriorly. Pectoral fin of moderate size, not elongate, but somewhat pointed; dorsal fin placed behind the middle of the body. Fingers moderately short; length of index equal to the distance between its base and the head of the humerus. All the bones of the fingers broader than long, except the proximal ones of the index and third fingers.

Skull subglobular, high. Rostrum short, tapering; breadth of base considerably more than half the breadth of the cranium; length nearly equalling the length of the remaining portion of the skull. Teeth small, round, conical, pointed, rather closely set and occupying the whole length of the jaw to nearly on a line with the notch. Dentition $\frac{12}{12}$ to $\frac{14}{14}$. Vertebræ 62 to 63.

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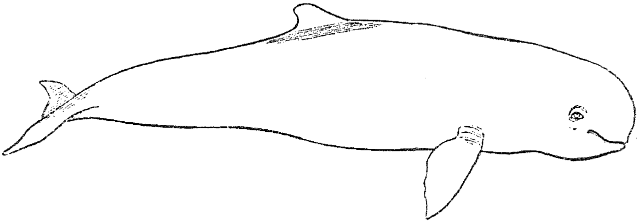
* Dr. Gray writes the name of this genus *Orcaella*, but for euphony's sake, and to avoid transgression against the laws of Latinity, I suggest *Orcella*.

Fig. 1.



Orcella brevirostris.

ORCELLA BREVIROSTRIS.

Phocæna (*Orca*, Gray, Reinhardt) *brevirostris*, Owen, Trans. Zool. Soc. Lond. vol. vi. p. 24 *et seq.* pl. ix. figs. 1, 2, 3.

Globiocephalus indicus, Blyth (in part), Journ. As. Soc. Beng. xix. p. 426, xxi. p. 358, et xxviii. p. 490; Cat. Mam. As. Soc. Museum, 1863, p. 89.

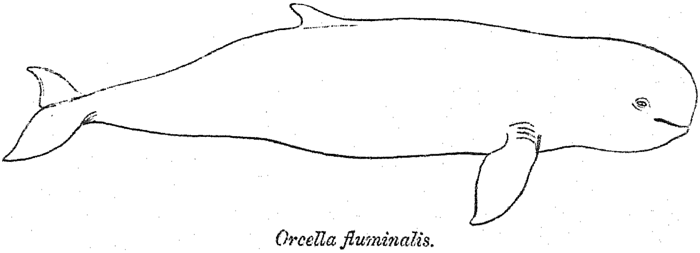
Orca (*Orcaella*) *brevirostris*, Owen; Gray, Cat. Seals and Whales British Museum, 1866, p. 285.

Dorsal fin rather large, rounded, falcate, and situated immediately behind the middle of the body; pectoral fin triangular, rather pointed, moderately broad at the base, posterior margin not emarginate. Upper surface slaty black, paling to grey on the sides and under surface.

Skull rather full and rounded behind, moderately broad in front; rostrum tapering, rather narrow at the base; dentition of adult $\frac{12}{12}$.

Hab. Bay of Bengal, Madras coast, occasionally frequenting the tidal streams of the Ganges, seventy or eighty miles from the sea.

Fig. 2.



Orcella fluminalis.

ORCELLA FLUMINALIS, n. sp.

Dolphin of the Irrawaddy, Anderson, P. Z. S. 1870, p. 220 et p. 544.

Dorsal fin low, small, pointed, falcate, and situated near the termination of the posterior third of the body; pectoral flipper subtriangular, pointed and emarginate posteriorly.

Uniform dirty white *.

Skull rather flat posteriorly, broad in front; rostrum short, broad at the base and not much tapered; dentition $\frac{14}{14}$.

Hab. The deep channels of the Irrawaddy river, Burmah, from 300 to 900 miles from the sea.

10. Note on the Occurrence of *Sacculina* in the Bay of Bengal. By JOHN ANDERSON, M.D., F.L.S., F.Z.S., &c., Director of the Imperial Museum, Calcutta, and Professor of Comparative Anatomy, Medical College, Calcutta.

[Received February 7, 1871.]

Some twelve years ago I directed attention to the not unfrequent occurrence of those remarkable forms of parasitic Crustaceans *Sacculina* and *Peltogaster* † on the common shore-crabs of these islands, *Carcinus mænas* and *Pagurus bernhardus*. These peculiar types of parasitic life have been lately referred by Fritz Müller to a new group, which he has designated *Rhizocephala*. Since my residence in the East, I have collected marine Crustacea on a large scale, and have critically examined all the species which would have been likely to yield these most interesting parasites, but have succeeded in finding only one species infested by them, and that to the exclusion of *Peltogaster*. The Crab (*Thalamita crenata*) which yielded *Sacculina* is the common swimming species of the rocky shores of the islands and coast of the Bay of Bengal. I have been fortunate enough to obtain only one specimen of the parasite. There is nothing in its outward appearance by which it can be separated from the species which is so prevalent on *Carcinus mænas* along our coast—a fact of great interest so far as it relates to the geographical distribution of these forms of life, provided that further investigations into the postovular development of the species verify its identity with the European form. In connexion with this, it is curious to note that while *Peltogaster* has been found hitherto only along the Danish and eastern and western coasts of the British Isles, *Sacculina* was first discovered by Cavolini on the shores of the Mediterranean. Further research may reveal the occurrence of the latter in the waters of the Red Sea.

The specimen of *Thalamita crenata* which yielded *Sacculina* was received from the Andaman Islands, in the Bay of Bengal.

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* I am indebted to Captain Bowers for our specimen of this Cetacean, and for the description of its colour when recently dead.

† Proc. Royal Physical Soc. Edinb. 1854, lviii. pp. 412–415; Ann. & Mag. Nat. Hist. 3rd ser. vol. ix. p. 12 *et seq.* pl. i.

February 21, 1871.

Osbert Salvin, Esq., F.Z.S., in the Chair.

The Secretary announced the birth of a Hippopotamus (*Hippopotamus amphibius*) in the Society's Gardens, which had taken place that day about 4.30 P.M. The Hippopotamus had previously bred in the Gardens of the Zoological Society of Amsterdam and in the Jardin des Plantes of Paris, but not in this country. Further particulars of this interesting occurrence were promised to be given from Mr. Bartlett's notes at the next meeting of the Society.

The Secretary exhibited on the part of Mr. Edwin Ward, F.Z.S., a collection of heads of mammals made in Ladakh by Mr. George Landseer.

Mr. Sclater exhibited a pair of tusks of a female Indian Elephant (*Elephas indicus*), which presented the appearance of having been corroded or eaten away in the basal portion, immediately adjacent to where they entered the gums. Just below this, on the outer side of each tusk, was deposited a mass of egg-like bodies arranged in regular series, apparently of some dipterous insect, and somewhat resembling those of the common Blowfly (*Musca vomitoria*). These tusks had been submitted to Mr. Bartlett for examination, by Mr. G. S. Roden, of the 1st Royals, lately stationed in India, who had communicated to Mr. Sclater the following note on the subject:—

"The tusks which I left with Mr. Bartlett belonged to a female elephant, which I shot last June at a place called 'Muddry,' at the foot of the Manantowady Mountains in Malabar.

" Directly after shooting her I lifted up her lips to see the size of the tusks, and then noticed the deposit of eggs on them. I had them carefully cut out. On cleaning the tusks afterwards I noticed that they had been eaten away at the ends, and also near where the white eggs were. *There were no maggots* in the grooves at the end of the tusks; they were merely filled up with some dark dry clay, just the same as what you see the eggs now surrounded by. The tusks have been slightly polished over; but I took great care that the eggs should not be touched."

Mr. Sclater remarked that a previous notice of the same phenomenon had appeared in a letter addressed to the 'Field' newspaper on the 12th March last, signed by a well-known Indian sportsman, under the pseudonym of "Smoothbore" *.

Mr. Sclater added that he had been informed by Prof. Flower that there was an exactly similar pair of tusks in the Museum of the Royal College of Surgeons, but that he had hitherto sought in vain for any information as to the name of this extraordinary parasite.

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* "Has any zoologist or microscopist ever noticed how the tusks of female elephants are attacked and eaten away by some parasite? and is it not most singular that this has never been observed in the tusks of the male?"—*Field*, March 12, 1870.

The following papers were read:—

1. Note on the *Tænia* from the Rhinoceros, lately described by Dr. J. Murie. By Professor W. Peters, F.M.Z.S.

[Received February 1, 1871.]

The very remarkable large cestoid worm, described doubtfully by Dr. Murie as a new species (*Tænia magna*, P. Z. S. 1870, p. 608), and based on imperfect specimens from the Indian Rhinoceros, appears to be the same which I found in the small intestines of the *Rhinoceros africanus*, and of which I gave in the monthly reports of the Royal Berlin Academy for 1856, p. 469, the following diagnostic description:—

"TÆNIA GIGANTEA, n. sp.

"*Caput magnum, latum, globosum, quadrilobum, rostello brevi rotundato conico, bothridiis crassis, margine postico libero; collum subnullum; corpus crassum lanceolatum; articuli brevissimi et latissimi, marginibus postice excisis, angulis obtusis; aperturæ genitales marginales secundæ; penes filiformes, limbo globoso cincti.*

"Long. tota 0·120 m.; art. max. 0·003; lat. max. 0·027–0·029; lat. cap. 0·006; colli 0·005.

"*Hab. Rhinoceros africanus*, Camper; in intestino tenui.—Mossambique."

The accurate figures given by Dr. Murie of the individuals of the worm in their different state of growth agree so perfectly with the African specimens that I cannot hesitate to regard them as belonging to the same species.

Fig. 1.

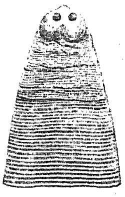

Fig. 2.

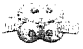

Fig. 1. Head and first segments of *Plagiotænia gigantea*, seen from the side.
2. View of head of the same in front.

I subjoin a figure of the head (the scolex), in case it might be judged convenient to communicate an additional note for the 'Proceedings,' and thus to make this, amongst its kindred, truly gigantic form better known.

It seems to me very doubtful whether this species ought to be left together in the same genus with *Tænia lata* and similar forms; for although the organ for fastening the animal chain does not show any essential difference, still the discrepancy of the complete forms is so great that it seems justifiable to separate them as a peculiar group, for which I propose the name ***Plagiotænia***, on account of their peculiar and enormous development in the transverse direction *.

2. Remarks on certain Species of Abyssinian Birds.

By J. H. Gurney, F.Z.S.

[Received February 1, 1871.]

I am desirous of laying before the meeting of the Zoological Society some brief remarks on a few paragraphs contained in Dr. Finsch's admirable paper on Abyssinian birds, read on June 10, 1869, and recently published in the Society's 'Transactions,' vol. vii. p. 197.

FALCO BARBARUS, Linn.

As Dr. Finsch does not speak very positively as to his identification of Mr. Jesse's specimen, I may state that I have recently examined it, and think that there is no doubt as to the correctness of Dr. Finsch's determination of it as a young bird of *Falco barbarus*.

I may add that, for the opportunity of examining this and most of the other specimens referred to in the following notes, I have been indebted to the kindness of Viscount Walden, in whose possession they now are.

P. 318. FALCO SACER.

Dr. Finsch supposes that "there is some doubt about the determination of this species;" but having seen Mr. Blanford's specimen, I can state positively that it is an example of *Falco sacer*, and has therefore been correctly identified.

P. 205. NISUS BADIUS (Gmel.).

Dr. Finsch expresses a strong opinion that there is "no difference between Rüppell's *Micronisus sphenurus* and the Indian *M. badius*;" but it is worthy of remark that Mr. Blanford, who has observed both in a state of nature, entertains the contrary opinion (*vide* 'Observations on the Geology and Zoology of Abyssinia,' p. 294), though there is no doubt that the two races, if distinct, are at least closely allied. *Accipiter brachydactylus* of Swainson is certainly identical with *A. sphenurus* of Rüppell.

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* I should not have recognized the worm by the description without the figures; for Dr. Murie says, in the description, p. 610, "The larger segments measure fully 1½ inch broad *and* 1 *inch long*; the smaller segments have a diameter of *an inch lengthwise* and across," which I do not understand, the greatest *length* being 3 millims., or *one-eighth of an inch*.

P. 210. BUBO ASCALAPHUS, Savig.

I have examined the specimen to which Dr. Finsch has assigned this name; and it appears to me not to belong to that species, but to the nearly allied *B. capensis*. To this species the type specimen of *Bubo dilloni*, Des Murs, which is preserved in the Museum of the Jardin des Plantes at Paris, where I have examined it, is also referable.

P. 210. BUBO LACTEUS, Temm.

Mr. Jesse notes the iris of this species as "bright yellow," which I venture to think is an error, as in all the specimens which have at different times been exhibited in the Society's Menagerie the iris has been very dark brown. In this respect this Owl agrees with all the other species of the subgenus *Nyctaëtus*, to which it belongs, as well as with those of the Asiatic subgenus *Huhua*, with which I am disposed to think that *Nyctaëtus* may be properly united.

P. 319. BUBO MACULOSUS (Vieill.).

Dr. Finsch considers that *B. cinerascens* of Guérin is not distinct from *B. maculosus*; but I feel convinced that if he had had the opportunity of comparing living specimens of the two species, which I have had more than once in the Society's Menagerie, he would have arrived at a contrary conclusion.

Independently of other differences, the iris in *B. maculosus* is bright yellow, whereas in *B. cinerascens* it is very dark brown—the latter bird belonging, like *B. lacteus*, to the subgenus *Nyctaëtus*.

P. 210. SCOPS SENEGALENSIS.

The specimen which Dr. Finsch refers to *Scops senegalensis* appears to me to belong to the nearly allied but more southern species *S. latipennis* (Licht.)—a race which is constantly distinguished by a blackish-grey tint over the whole plumage, which is very marked in Mr. Jesse's specimen, and which I have never seen in *Scops senegalensis*. Mr. Jesse's bird is the only example I have seen of *Scops latipennis* from any locality north of the equator.

P. 235. THAMNOLÆA ALBISCAPULATA, Rüpp.

Dr. Finsch has the following remark under this head:—"This species has often been erroneously confounded with the southern *T. cinnamomeiventris*, Lafr., a very nearly allied but very different species. The north-eastern *T. albiscapulata* is distinguished by having the upper and under tail-coverts black, the latter being only cinnamomeous at the base, whereas in *T. cinnamomeiventris* these parts are uniform cinnamon like the rump and under surface. Mr. Layard and Mr. Gurney have overlooked these differences, and make the southern bird the same as the north-eastern." On this point I wish to observe that Rüppell, in his 'Neue Wirbelth.' pl. 26. fig. 1, represents *Thamnolæa albiscapulata* with both the upper and under tail-coverts entirely cinnamomeous, and not black as in the specimens examined by Dr. Finsch.

P. 318. ARDEA ATRICAPILLA (Afzel.).

Dr. Finsch refers to an opinion which I expressed, and which was quoted in 'The Ibis' for 1869, p. 437, that this Heron is not separable from *A. javanica*, Horsf.

I have subsequently had reason to alter my views on this subject, as will be seen on reference to 'The Ibis' for 1870, p. 151, where I have expressed my belief that the two races are specifically distinct.

3. On some Indian Reptiles. By JOHN ANDERSON, M.D., F.L.S., F.Z.S., &c., Director of the Indian Museum, Calcutta.

[Received February 2, 1871.]

The reptiles described in the following notes, with a few exceptions, have been added to the collection of the Indian Museum, Calcutta, within the last five months. As some are recent additions to the Indian fauna, while others belong to little-known species, I have given a full description of each, and have taken, as far as possible, Dr. Günther's work on the reptiles of India as my guide. When the synonyms of a species are not given it is to be understood that they are accepted as defined by Günther.

It will be observed that a number of Mr. Blyth's types of Batrachia in the Indian Museum have been identified. These are of peculiar interest, as Mr. Theobald was under the impression when he drew up his catalogue of the reptiles in the Asiatic Society's Museum that they had disappeared from the collection.

As the majority of the specimens from which the descriptions were derived reached me very shortly after the reptiles had been collected, it was in my power to describe the coloration almost as it occurs during life; and from the circumstance, too, that the collections were made on a very large scale, and embraced a very extended series of duplicates, I have been in a position to indicate many variations of species hitherto unrecorded.

List of Species described in the following pages.

CHELONIA.

EMYDIDÆ.

1. *Pangshura tecta*, Gray. Jumna, Agra.

2. *Pangshura flaviventer*, Gthr. Jumna, Agra.
3. *Batagur elliotti*, Gray. Jumna, Agra.

TRIONYCIDÆ.

4. *Trionyx phayrei*, Theobald. Penang.

SAURIA.

VARANIDÆ.

5. *Varanus flavescens*, Gray. Agra.
6. *Varanus dracæna*, Linn. Khasi Hills.
7. *Varanus lunatus*, Gray. Agra.

LACERTIDÆ.

8. *Tachydromus haughtonianus*, Jerdon. Assam.
9. *Tachydromus sexlineatus*, Daud. Assam, Khasi Hills.

ZONURIDÆ.

10. *Pseudopus gracilis*, Gray. East of Dacca, Khasi Hills, and Darjeeling.

SCINCIDÆ.

11. *Euprepes macularius*, Blyth. Assam, Cachar, Eastern Bengal, and Central India.
12. *Euprepes trivittatus*, Gray. Madras.
13. *Eumeces sikimensis*, Blyth. Darjeeling.
14. *Eumeces indicus*, Gray. Darjeeling and Assam.
15. *Eumeces albopunctatus*, Gray. Assam.
16. *Riopa anguina*, Theobald. Prome, Burmah.

GECKOTIDÆ.

17. *Gecko smithii*, Gray. Java.
18. *Hemidactylus maculatus*, D. & B. Burrabhoom, Berar.
19. *Phelsuma andamanense*, Blyth. Andamans.
20. *Gymnodactylus fasciolatus*, Blyth. Subathoo.
21. *Gymnodactylus variegatus*, Blyth. Moulmein.
22. *Gymnodactylus khasiensis*, Jerdon. Khasi Hills.
23. *Eublepharis macularius*, Blyth. Salt range.

AGAMIDÆ.

24. *Draco dussumieri*, D. & B. Travancore.
25. *Japalura variegata*, Gray. Darjeeling.
26. *Sitana minor*, Gthr. Central Provinces.
27. *Calotes versicolor*, Daud. Darjeeling.
28. *Calotes maria*, Gray. Garo Hills.
29. *Calotes mystaceus*, D. & B. Garo Hills.

30. *Oreotiaris tricarinatus*, Blyth. Darjeeling.
31. *Tiaris subcristata*, Blyth. Andamans and Nicobars.
32. *Uromastix hardwickii*, Gray. Agra district, Punjab, and Scind.
33. *Charasia dorsalis*, Gray. Western Bengal, Central and Southern India.

OPHIDIA.

TYPHLOPIDÆ.

34. *Typhlops bothriorhynchus*, Gthr. Garo Hills.
35. *Typhlops horsfieldii*, Gray. Assam.

OLIGODONTIDÆ.

36. *Oligodon dorsalis*, Gray. Khasi Hills.
37. *Simotes russellii*, Daud. Singhbhoom.
38. *Simotes punctulatus*, Gray. Darjeeling.
39. *Simotes bicatenatus*, Gthr. Calcutta and Garo Hills.

COLUBRIDÆ.

40. *Ablabes rappii*, Gthr. Darjeeling.
41. *Ablabes collaris*, Gray. Darjeeling and Garo Hills.
42. *Trachischium fuscum*, Blyth. Darjeeling.
43. *Coluber porphyraceus*, Cantor. Darjeeling.
44. *Compsosoma reticulare*, Cantor. Garo Hills and Darjeeling.
45. *Cynophis helena*, Daud. Galle, Ceylon.
46. *Ptyas korros*, Reinw. Assam.
47. *Zamenis diadema*, Schlegel. Agra.
48. *Zamenis brachyurus*, Gthr. Berar.
49. *Tropidonotus quincunciatus*, Schlegel. Assam, Agra.
50. *Tropidonotus macrophthalmus*, Gthr. Darjeeling, Assam.
51. *Tropidonotus platyceps*, Blyth. Darjeeling.
52. *Tropidonotus subminiatus*, Reinw. Darjeeling, Assam.
53. *Tropidonotus himalayanus*, Gthr. Darjeeling.
54. *Tropidonotus stolatus*, Linn. Assam.
55. *Tropidonotus plumbicolor*, Cantor. Ceylon.

HOMALOPSIDÆ.

56. *Cantoria dayana*, Stoliczka.
57. *Cerberus rhynchops*, Schneid. Bengal, Burmah, and Andamans.
58. *Ferania sieboldii*, Schleg. Burma and Agra.
59. *Hipistes hydrinus*, Cant. Moulmein River.

PSAMMOPHIDÆ.

60. *Psammophis condanarus*, Merr. Simla, Himalaya, and Lower Bengal.
61. *Psammodynastes pulverulentus*, Boie. Darjeeling.

DENDROPHIDÆ.

62. *Dendrophis picta*, Gm. Darjeeling and Garo Hills.
63. *Dendrophis picta*, Gm., var. *andamanensis*. Andamans.

DRYIOPHIDÆ.

64. *Tragops prasinus*, Reinw. Darjeeling.
65. *Dipsas hexagonota*, Blyth. Darjeeling, Bengal, and Andamans.
66. *Dipsas forsteni*, D. & B. Western Bengal and Ceylon.

LYCODONTIDÆ.

67. *Lycodon striatus*, Shaw. Agra and Lahore.
68. *Leptorhytaon jara*, Shaw. Garo Hills.

AMBLYCEPHALIDÆ.

69. *Pareas monticola*, Cant. Afghanistan, Mesopotamia, and Khasi Hills.

ERYCIDÆ.

70. *Eryx johnii*, Russell. Agra.

ELAPIDÆ.

71. *Ophiophagus elaps*, Schlegel. Darjeeling and Eastern Bengal.
72. *Bungarus cæruleus*, Schneid. Assam and Agra.
73. *Callophis macclellandii*, Reinh. Assam.

HYDROPHIDÆ.

74. *Platurus fischeri*, Jan. Calcutta.
75. *Hydrophis jerdonii*, Gray. Pooree, Bengal.
76. *Hydrophis chloris*, Daud. Pooree, Bengal.
77. *Hydrophis lindsayi*, Gray. Calcutta.
78. *Hydrophis coronata*, Gthr. Calcutta.
79. *Hydrophis cantoris*, Gthr. Calcutta.
80. *Hydrophis granosa*, n. sp. Sand Heads, Hughli.
81. *Hydrophis cyanocincta*, Daud. Pooree, Bengal.
82. *Enhydrina schistosa*, Daud. Gopalpore.

CROTALIDÆ.

83. *Trimeresurus gramineus*, Shaw. Darjeeling.
84. *Trimeresurus erythrurus*, Cant. Assam.
85. *Trimeresurus carinatus*, Gray. Garo Hills.
86. *Trimeresurus monticola*, Gthr. Darjeeling, Khasi Hills, and Yunan, W. China.
87. *Trimeresurus convictus*, Stoliczka. Pinang.
88. *Halys himalayanus*, Gthr. N.E. of Simla.

VIPERIDÆ.

89. *Daboia russellii*, Shaw. Calcutta.
90. *Echis carinata*, Schneid. Western Bengal, Madras, and Agra.

BATRACHIA.

BATRACHIA SALIENTIA.

91. *Rana kuhlii*, Schleg. —— ?
92. *Rana cyanophlyctis*, Schneid. Bengal, Burmah, and Malayan peninsula.
93. *Rana tigrina*, Daud. Agra.
94. *Rana liebigii*, Gthr. Sikkim.
95. *Rana gracilis*, Wiegm. C. India, Bengal, Burmah, and Malayan peninsula.
96. *Rana fusca*, Blyth. Tenasserim.
97. *Rana crassa*, Jerdon. Carnatic and Ceylon.
98. *Pyxicephalus breviceps*, Schneid. Agra.
99. *Xenophrys monticola*, Gthr. Darjeeling.
100. *Cacopus globulosus*, Gthr. Bengal (Calcutta).
101. *Diplopelma berdmorei*, Blyth. Pegu.
102. *Diplopelma interlineatum*, Blyth. Pegu.
103. *Bufo pantherinus*, Boie. Agra.
104. *Bufo melanostictus*, Schneid. Agra.
105. *Bufo sikkimensis*, Blyth. Sikkim.
106. *Hylorana nigrovittata*, Blyth. Pegu.
107. *Hylorana nicobariensis*, Stoliczka. Nicobars.
108. *Polypedates maculatus*, Gray. Darjeeling.
109. *Polypedates quadrilineatus*, Wiegm. Assam.
110. *Polypedates smaragdinus*, Blyth ? Assam.
111. *Polypedates marmoratus*, Blyth. Pegu, Kakhyen Hills, N.E. of Burmah, and Darjeeling.
112. *Polypedates hascheanus*, Stoliczka. Pinang Hill.
113. *Polypedates annectens*, Jerdon. Khasi Hills.
114. *Rhacophorus maximus*, Gthr. Assam and Khasi Hill.
115. *Callula pulchra*, Gray. Calcutta, and Upper Burmah.

PANGSHURA FLAVIVENTER, Gthr. Rept. Brit. Ind. p. 35.

This specimen was found on the Jumna, near Agra. It has the markedly bell-shaped first vertebral, but wants the impression on the middle of the second and third costal plates mentioned by Günther. The gulars are nearly as broad as long, but their suture is as long as that of the postgulars. The transverse suture between the gulars and pectorals is not so marked as in the figure in the 'Reptiles of British India.' In every other respect, almost to its size, 8″ 4‴, it is identical with Günther's description.

PANGSHURA TECTUM (Bell); Gthr. *l. c.* p. 33.

Jumna River, Agra.

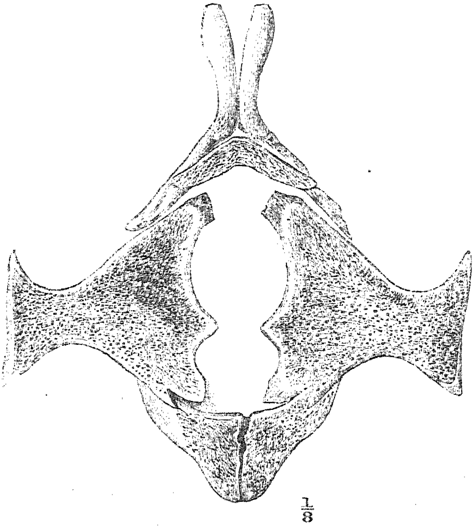
Batagur elliotti, Gray; Gthr. *l. c.* p. 40.

A specimen from the Jumna River, Agra, agrees in every particular with this species. It is immature, and the sternum is only imperfectly joined to the carapace.

Length 3″ 9‴.

Trionyx phayrei, Theobald, Journ. Proc. Linn. Soc. x. (1868) p. 18.

Trionyx jeudi, Gray, Proc. Zool. Soc. 1869, p. 217, fig. 19, et Suppl. Cat. Shield Rept. B.M. 1870, part 1, p. 97, fig. 32.



Sternum of *Trionyx phayrei*.

I have lately received a specimen of this fine species from Penang. It measures along the curve of the carapace 27″ 6‴; osseous portion of carapace 19″ 6‴. Breadth in middle 22″ 3‴; osseous portion at same point 20″ 6‴. Sternum, length of osseous portion 21″ 6‴. Greatest breadth of abdominal plates 21″. Seven osseous plates, of which five are visible and granular; the anterior pair long and linear, 5″ 9‴ × 1″, in contact behind, divergent anteriorly. Odd osseous plate semicircular, 7″ 5‴ along the curve, 1″ 3‴ in diameter in the mesial line; anteriorly in contact with the anterior pair, and posteriorly with the abdominal ones. Greatest length of abdominal plates 8″; they enclose an hour-glass-shaped cartilaginous area, the anterior portion being the largest, and measuring 4″ 3‴ in diameter and 6″ 8‴ in length from the posterior contraction to the odd plate.

The posterior dilatation is 3″ 3‴ in diameter, and 3″ 5‴ in length. The greatest external length of the abdominal plates is 7″, and their narrowest portion measured antero-posteriorly is 2″ 6‴. The inguinal plates are triangular, and in close contact with the abdominal ones, and form a zigzag suture with each other: their greatest length is in the mesial line, 4″ 3‴; and the greatest breadth across the anterior margin of one is 4″ 5‴. The odd and inguinal sutures are marked with many raised lines bearing tubercles in some cases. The lines are rather weak for the size of the specimen. The abdominal plates are marked with lines of the same character as in the former; but the tubercles are much more numerous, especially on the external and internal portions, and on the former in particular they form well-marked, closely packed, shining papillæ.

There is a well-marked swelling anteriorly on the mesial line, with a slight depression on either side externally and posteriorly; the vertebral line is concave behind the swelling within about two inches of the end, where it is again convex.

The general surface is not so rough compared with the great size of the animal as in *T. gangeticus*.

The wavy raised lines and the tubercles that they bear are more sparse and coarser on the vertebral line, and along the lines of the sutures of the costal plates, and not merely on the vertebral line, as observed by Theobald.

The chief differences that separate it from *T. gangeticus* are the less developed character of the osseous portion of the sternum, and the relatively finer character of its sculpturing on both aspects. The toes are broadly webbed, and the claws are strong conical structures, the largest being about one inch in length.

T. jeudi, which is doubtfully assigned by Dr. Gray to the island of Java, was described from a skull in the British Museum. This I have carefully compared with the skull of the specimen from which the foregoing description is derived, and cannot detect any characters by which to separate the two.

VARANUS LUNATUS, Gray; Gthr. *l. c.* p. 66.

This species appears to be common in the Agra district. The adults are olive-brown above, yellower on the tail and underparts, and very obscurely banded on the sides, with a darker tint of the same colour as the upper parts, where the banding is scarcely perceptible. It is more marked, however, on the tail. Some of the specimens are black, spotted on the sides and back in almost the same way as *V. dracæna*. The largest specimen is 45½ inches, of which the tail measures 26″.

These lizards are much infected by ticks about the anal region, neighbourhood of head, and body generally.

VARANUS FLAVESCENS, Gray; Gthr. *l. c.* p. 65.

I have received a young specimen of this species from Agra. It is light yellow, banded with brown.

VARANUS DRACÆNA, Linn.; Gthr. *l. c.* p. 66.

This species also occurs in the Agra district; and I have received a specimen from the Khasi Hills. The latter has eighty-three, and the former eighty-five transverse rows of scales between the gular fold and the groin.

TACHYDROMUS HAUGHTONIANUS, Jerdon, Proc. As. Soc. 1870, p. 72.

Four pairs of chin-shields, the last as large as the three anterior pairs. Upper labials irregular, 8 + 9; eight very narrow lower labials. Six longitudinal series of strongly keeled dorsal scales; ten longitudinal rows of strongly keeled abdominal scales; twenty-seven transverse rows from the axil to the inguinal pores. A line of enlarged granules along the lateral margins of the dorsal and ventral scales. Axilla and some distance behind it granular. One pair of inguinal pores at the base of the thigh. A large central anal shield, with two smaller pairs external to it. Upper surface and front of the limbs with large, almost shield-like scales, hinder and under aspect granular. Tail covered with large strongly keeled scales.

Upper surface of shady brownish black, disappearing on the middle of the tail. A greenish-yellow band from above and before the eye, along the external series of dorsal scales, disappearing on the base of the tail. A black band from the nostril, through the eye and one-half of the ear, along the granular area of the side, paling to olive-brown posteriorly, and disappearing on the base of the tail. From the lower margin of the ear to the nostril in a straight line, involving the upper labials, and all the under surface of the body is yellow. Limbs yellowish, their upper surface finely and densely punctulated with brown. Tail yellowish. Length 8″ 2‴; tail 5″ 9‴.

Hab. Goalpara, Assam.

I cannot allow Dr. Jerdon's statement that he had my permission to describe and name this Lizard to pass without comment. I placed the Museum collection of Reptiles at Dr. Jerdon's disposal for comparison; but I certainly never contemplated that he would make use of the confidence I reposed in him to describe this Lizard without my sanction.

TACHYDROMUS SEXLINEATUS (Gthr. *l. c.* p. 69) is not uncommon in Assam and the Khasi Hills.

PSEUDOPUS GRACILIS, Gray; Gthr. *l. c.* p. 74.

I have received specimens of this species from the undulating country to the east of Dacca, from the Khasi Hills, and Darjeeling (3500 ft.). I obtained it also in the Sanda valley, Western Yunan, at an elevation of 1900 feet. Mr. Blyth purchased his specimens in Rangoon. Its occurrence in these localities, all of which are subject to a heavy rainfall, would seem to indicate that it is partial to moisture.

I have since received two other specimens from Darjeeling, one with the tail perfect, which is a rare circumstance in this reptile. The largest specimen, with the tail imperfect, has the body 5″ 3‴ in length; and the measurements of the perfect specimen are, body 4″ 3‴, tail 9″ 3‴. The dorsal scales are in sixteen rows from fold to fold, of which the dorsal ten or twelve are very strongly keeled. The youngest specimen has only a few obscure dull brown spots on the back; but the larger one is marked by irregular bright blue wavy cross bands margined anteriorly with black. It occurs at Darjeeling at 3500 feet.

EUPREPES MACULARIUS, Blyth; Gthr. *l. c.* p. 81.

Supranasals separated from each other by the single præfrontal, which forms a small suture with the vertical. The fifth upper labial is below the orbit, and much longer than high. Opening of the ear of moderate size, with a tubercle in front. Scales with from five to seven keels; twenty-eight to thirty longitudinal rows round the body, and thirty transverse series between the axils. Fore limb when laid forward reaches to the middle of the eye; and the hind limb covers more than two thirds of the interval between the axils.

Dark brown above, with eight narrow longitudinal broken black lines produced by linear black spots, or with eight lines of dark brown spots beginning over the shoulder, sometimes restricted to lower region of back, at other times entirely absent. A broad black band, spotted with white, begins behind the eye, and is continued to the thigh, where it is resolved into dark brown lines, which are prolonged on to the side of the tail. Outside of limbs white-spotted; upper labials white, margined with brown. In the month of August below and behind the shoulders suffused with orange. Length, adult $2\frac{2}{8}$, tail $3\frac{5}{8}$, $=5\frac{7}{8}$ inches.

Specimens from the Central Provinces of India have no traces of black lines, but are sometimes spotted on the posterior half, but in others they are without spots. Five is the prevailing number of keels, although a few can be detected with seven. The brown line of the side is not well marked, and is nearly broken up into black spots, among which a few white ones are interspersed. Specimens from Raipur have much the same character as the foregoing; and, indeed, the southern specimens have the brown band along the side much more feebly marked than in specimens from Assam, which was in all likelihood the locality from which Blyth obtained his type. Specimens from Sirgooja, which lies as it were halfway between Upper Assam and the southern Indian localities, have nearly all the coloration of the Assam ones, although the black spots do not unite to form continuous dorsal lines. The further south we proceed the more uniform do the colours appear to become.

This species does not appear to attain the size of *E. rufescens*, with which it could never be confounded; and my largest specimen out of twenty-seven is $5\frac{7}{8}$ inches in length.

It appears to be a widely spread form; and I have it from Goalpara, Assam, Cachar, Sirgooja, Bilaspur district, and S.E. Berar and Bhandara, Central Provinces.

EUMECES TRIVITTATUS, Gray, would seem to be more nearly allied to *E. macularius* than to *E. rufescens*. It has five keels, and thirty-six longitudinal rows of scales round the body, and forty-five to forty-nine transverse rows between the axils. The nasals form a suture in front of the præfrontal, and the postfrontals a broad suture in front of the vertical. The white vertebral and lateral bands are margined with darker brown than the intervening brown space, and the shields of the head are partially margined with dark brown. The fore limb when laid forward reaches to the angle of the mouth, and the posterior limb about halfway between the two axils.

Hab. Salnat, Madras.

EUMECES SIKIMENSIS, Blyth.

Mocoa sikimensis, Blyth, Journ. As. Soc. Beng. vol. xxii. p. 652.
Eumeces himalayanus, Gthr. Rept. Brit. Ind. p. 86.
? *Eumeces indicus* (Gray), Gthr. *l. c.* p. 89.

This species agrees in its transparent eyelid and all its other details with Günther's *E. himalayanus*.

I have lately received two specimens from Darjeeling, from an elevation of 4500 feet.

EUMECES INDICUS, Gray; Gthr. *l. c.* p. 89.

Three specimens have from thirty-six to forty longitudinal rows of scales round the body, with about fifty transverse series between the axil and groin.

Length.	Tail.
in.	in.
$7\frac{5}{8}$	$3\frac{6}{8}$
7	$3\frac{4}{8}$
$5\frac{3}{8}$	$2\frac{6}{8}$

The back of the young specimen is olive-brown, with two longitudinal series of black spots from before the shoulder to beyond the tail. The broad lateral band is well defined and covered with white spots, and has an ill-defined white line below it, extending from the angle of the mouth to the groin; the sides of the throat and the belly below it are marbled with fine black spots. Upper surface of the limbs finely spotted with black.

Hab. Darjeeling, Geelsaugor, and Assam.

EUMECES ALBOPUNCTATUS, Gray.

This specimen unfortunately wants the tail; the body measures 2″ 4‴. The back has four lines of small dots along its middle; and the blackish brown of the sides is spotted with white. Length of hind limb 6‴.

The largest specimen in this museum measures 5″ 4‴, of which the tail forms 3″ 9‴. There are thirteen, and all have four dorsal lines of small dots. Blyth's specimens, said to have come from

Mergui, are not separated under this locality; and it is impossible to say whether they were of this species.

Hab. Debrooghur, Assam.

RIOPA ANGUINA, Theobald, Journ. Proc. Linn. Soc. Lond. vol. x. p. 27.

Lower eyelid transparent. The body very much elongated and slender; limbs small and feeble. The distance between the axil and snout is contained two and a half times in the length between the fore and hind limbs. Tail little more than the distance between the vent and fore limbs. The fore limb when laid forwards falls considerably short of the ear, and equals the distance from the ear to halfway between the eye and the tip of the snout. The hind limb is the distance between the axil and the ear, and is in excess of the distance between the ear and the snout. Snout moderately short and pointed; supranasals forming a broad suture behind the rostral; the frontal and vertical suture widely separating the first frontals. Vertical moderately elongated, lateral margins convergent to a point behind. Two pairs of occipitals. Four large superciliaries with two small scale-like shields behind the last. Seven upper labials. A large broad shield behind the mental, with two large shields behind the former, forming a long suture with each other and succeeded by a small triangular shield with a large one on either side of it. Ear without denticulations. Twenty-two series of smooth scales round the middle of the body; the scales are rather broad, and rounded behind; sixty-five rows of scales between the fore and hind limbs. Uniform olive-brown above, with or without a line of black spots along the side of the back, margined above by a pale narrow band, sometimes obscurely spotted with white on the side behind the ear and above and behind the shoulder. Upper surface of the tail yellowish brown; under surface yellowish.

Prome, Upper Burmah.

Dr. Stoliczka* has recently described another species of this genus, *R. lineolata*, with a scaly eyelid and twenty-eight series of scales round the body.

GECKO SMITHII, Gray; Gthr. *l. c.* p. 103.

Granular above, the granules flat and arranged somewhat in transverse rows on the body and tail; many large circular flattened tubercles with a small central prominence interspersed among the granules, smaller on the occiput and temporal region, and large on the body, and arranged in transverse rows on the tail at regular intervals. Sixteen low upper labials, and twelve deep lower ones; two large shields behind the mental with an azygos one behind them, with two small ones on either side of it; a line of four large shields between the second, third, and fourth lower labials, with about five parallel shields below the remaining labials. The granules on the occiput and between the eyes small, those on the eyelid large and circular. Two large plates behind the rostral, with a moderate-sized azygos shield wedged into the hinder margin of their suture.

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* Journ. As. Soc. Beng. 1870, vol. xxxix. p. 175.

General colour dark brown, paler on the head. Six cross bands, formed by about six white spots, usually involving a large tubercle. A line of white spots from the lower posterior margin of the eye, over the eye, and round the nape to the opposite eye; a similar lunate band of spots from ear to ear over the shoulder; an enlarged parotid-like gland on the side of the neck before the shoulder. Tail with eight white bands; the last in the specimen before me is terminal; but the tip of the tail appears to have been lost. Thirty longitudinal lines of small scales in the middle of the belly. Under surface dirty yellow, sparsely marbled with brown. Feet white-spotted.

Length of body 2″ 4‴, tail 2″ 5‴.

Hab. Java.

HEMIDACTYLUS MACULATUS, D. & B.; Gthr. *l. c.* pp. 107, 108.

Two specimens, male and female, from Burrabhoom have only ten and nine upper labials, the lower labials in each being eight. The femoral and præanal pores are interrupted in the middle by the breadth of four lines of abdominal scales. Thirty-eight longitudinal series of abdominal scales.

I have a specimen of this Lizard with a three-forked renewed tail, resembling a fifth limb.

PHELSUMA ANDAMANENSE, Gthr. *l. c.* p. 112.

I have dissected Blyth's type of this species, and find it to be a female. There is another bottle in this museum, without a locality or name, containing males and females of a Gecko, the latter of which agrees with this species in every particular; and as the males only differ from the females in having femoral pores, it appears that the males and females are of one species with *P. andamanense*, and that this species has femoral pores like its near allies. These structures in the unnamed specimens extend along nearly the whole thigh; and the series is directed forwards to the mesial line, where it is continuous with the one of the other side; they vary in number from twenty-nine to thirty-two. The chin-plates selected by Blyth as a specific character seem to vary; for the specimen which has given rise to these remarks, and which was only lately received from the Andamans, and is also a female, has these shields differently arranged from the type, with which, however, it is identical in every other respect. It is curious to observe that the variation that occurs in this specimen is in the direction of the arrangement that prevails in the nearly allied Mauritian form, in which a pair of shields lying side by side are in contact with the chin one, which has three or four larger ones on either side of it. In Blyth's specimen, a single shield lies behind the chin-shield, with three or four shields of nearly equal size on either side of it. Three of the specimens without locality show a similar variation to the one just described; one is intermediate; and only two show the single shield behind the chin in the decided way of the type. All these specimens have the round ear of *P. andamanense.*

Blyth does not allude to the compression of the root of the tail from above downwards, or to its being thrown into folds at nearly regular intervals (at any of which it is very liable to fracture), or to the verticillate distribution of the small tubercular-looking scales, or to the enlarged subcaudals.

Upper labials ten, lower labials seven to nine. Length of largest specimen 5⅞ inches, of which the tail measures 3 inches.

Hab. Andamans.

GYMNODACTYLUS FASCIOLATUS, Blyth; Gthr. *l. c.* p. 116.

Naultinus fasciolatus, Blyth, Journ. As. Soc. Beng. xxix. p. 114.

Body finely granular, with numerous enlarged trihedral tubercles. Granules on tail verticillately arranged, and tubercles disposed in rings. A series of enlarged subcaudals. Tail slightly flattened from above downwards, cylindrical at the base. Scales in the middle of the belly in thirty-six longitudinal series. Nostril formed by the rostral anteriorly, by the first labial, by the nasal and a small shield between it and the labial; rostral notched and grooved, with a small plate between the two nasals. Twelve upper and eleven lower labials. Mental shield partially wedged in between two large pentagonal chin-shields, which have a small quadrangular shield on the concave external half of their lateral margins. Three rows of enlarged scales below the lower labials. Claws non-retractile; five fingers and toes, with from four to nine transverse plates on the basal depressed portion. A slight fold of skin along the side, corresponding to the line of union of the belly- scaled and dorsal granuled portions of the body (probably a post-mortem appearance as in *Puellula,* Blyth). An area of enlarged præanal scales. The femoral pores, five or six on each side, extend outwards in a line with the commencement of the thigh.

A dark brown band, edged behind with white, from the eye to the occiput, where it meets its fellow of the opposite side. A brown similarly white-edged band on the nape, with seven cross bands on the body; thirteen on the tail, the white edging disappearing posteriorly.

This species has the toes and claws of *Gymnodactylus,* and its femoral pores distributed outwards in the direction of the thighs.

Mr. Blyth considered this species closely allied to the following, from which it differs in the smaller size of the belly-scales and in the greater number of femoral pores.

Hab. Subathoo.

GYMNODACTYLUS VARIEGATUS, Blyth; Gthr. *l. c.* p. 116.

Naultinus variegatus, Blyth, Journ. As. Soc. Beng. 1859, xxviii. p. 279.

Body granular, covered with numerous large trihedral tubercles. Tail cylindrical, the granules arranged in verticils, and the tubercles in rings. A series of enlarged subcaudals. Twenty-six longitudinal rows of rather elongated leaf-like scales on the middle of the belly.

A fold of skin along the side, indicating where the abdominal scales terminate and the granules begin. Ten large præanal scales, and sixteen femoral pores on each side along the whole length of the thigh. Rostral notched behind and grooved, with a small hexagonal shield occupying the notch with the nasals in contact with it; nostril formed by the rostral anteriorly, first labial inferiorly, two small tuberculoid shields posteriorly, and the nasal superiorly. Ten to eleven upper labials, and eleven lower labials. Mental partially wedged in between the two large chin-shields, which form a broad suture with each other. Two rows of enlarged shields below the lower labials. Limbs and toes slender; the basal joints are not very distinct from the terminal ones, which are strongly compressed, and are provided with transverse imbricate plates below and a series of much smaller ones on the compressed phalanges.

Blyth describes the colour as "grey, beautifully spotted and marbled with black, set off with subdued white; and the lower parts whitish, freckled on the tail with black and gradually more so to the extremity, the terminal third being almost wholly blackish; above, the tail is irregularly banded. A broad dark streak bordered with whitish behind each eye, and continued irregularly round the occiput. On the back the markings appear as irregular bands, paler internally and blackish on their zigzag borders, most difficult to describe intelligibly; the head above is spotted and not banded."

Length 6″ 8‴; tail 3″ 6‴.

Hab. Moulmein.

The walls of the nostril, the character of the rostral above, with its azygos shield impacted between the nasals, and the imbrication of the plates on the basal phalange of the toes and fingers serve, as with the other species, to connect this genus with *Pentadactylus*, from which it is separated, however, by its non-retractile claws and the absence of a claw-sheath.

GYMNODACTYLUS KHASIENSIS.

Pentadactylus (?) *khasiensis*, Jerdon, Proc. As. Soc. Beng. 1870, p. 75.

Habit similar to that of *G. variegatus*, Blyth. Body finely granular, thickly covered with small trihedral tubercles; upper surface of the head wholly granular. Tubercles on the base of the tail and numerous on the hind extremities, absent on the fore limbs. Tail cylindrical, considerably longer than the body, with round flat almost scaly tubercles of uniform size arranged in verticils, larger and irregular on the under surface. No enlarged tubercles on the upper surface of the tail, except those at the base; no large subcaudals. Two large supranasal shields behind the rostral, transversely elongated, forming a suture in the middle and the upper margin of the nostril; anterior and lower margins of nostril formed by the rostral; first labial below the nostril. Ten or eleven upper, and nine lower labials. Five large, rather elongated pentagonal shields behind the mental, with a few enlarged shields behind them below the labials. Tongue elongate, notched in front. Scales on the under surface small, rounded, and imbricate; thirty-seven longitudinal series on the middle of the belly. Præanal pores in angular series, eleven or thirteen in number, continuous, part extending on to the thighs.

Brown, with a series of moderate-sized arrow-shaped brown spots along each side of the vertebral line, with the point directed backwards, sometimes connected together, with a series of more obscure brown spots below them on the sides; the vertebral spots are confluent on the tail, forming about eleven brown rings, which encircle it, with yellowish-brown interspaces between them; the tip black; the nape and occiput reticulated with brown; under surface dirty yellow.

Dr. Jerdon was inclined to regard this as a form of *Pentadactylus*; but its strong non-retractile claws at once separate it from that genus. It is in every respect a true *Gymnodactylus*.

Hab. Khasi Hills.

EUBLEPHARIS MACULARIUS.

Cyrtodactylus macularius, Blyth, Journ. As. Soc. Beng. xxiii. pp. 737, 738.

Eublepharis macularius (Blyth); Theobald, Cat. Rept. As. Soc. Museum, p. 32.

Habit similar to that of *E. hardwickii*. Sides and back with oval conical tubercles, widely separated from each other by densely packed minute granules; the tubercles on the head, as far forward as the anterior angle of the eye, are separated from each other by the granules. Under surface covered by more elongated imbricate scales than in *E. hardwickii*. Twenty-seven longitudinal series on the middle of the abdomen. Eleven upper and lower labials. Nostril in a single shield above the first labial, with a moderate-sized supranasal rostral. A pair of the large chin-shields behind the mental, with four smaller ones in transverse series behind it. Fingers longer and more slender than in *E. hardwickii*. Tail short, verticillated and conical, almost granular above, with eight large tubercles in transverse series on the posterior margin of each verticil; under surface with numerous divided and subdivided irregular moderate-sized subcaudals.

Colour in spirit uniform whitish, without any trace of bands. Blyth describes the coloration of this species in terms that would almost apply to *E. hardwickii*, with this difference, however, that he mentions a third black band where the hind limbs are articulated, and that the "rosy carneous interspaces" have a few black tubercles interspersed among the numerous pale tubercles. In a half-grown specimen he describes the interior of the black bands as pale and speckled with black, the margins continuing black. In his type specimen he mentions the dark line as almost having left the crown, "its blackish margins only remaining as a streak from the nostril through the eye, and continued round to join its opposite upon the occiput;" crown and cheeks mottled with dark spots more or less confluent; and the interspace from the occiput to the nape has many black tubercles. Blyth gives the length of this specimen from the snout to the vent as 3⅛ inches, and regards the specimen as a young one. This is the length of the much-bleached specimen in this museum labelled *E. macularius*, from the Salt range, where it was discovered by Mr. Theobald, who informed Mr. Blyth that "the species attains more than double the size, and when alive is remarkable for the beauty of its prevailing rosy carneous hue." Blyth had more than one specimen before him when he wrote; and as he had already identified *E. hardwickii* (*Gymnodactylus lunatus*, Blyth *), he was in a position to judge of the specific distinctness of the two. The type specimen, however, is the only one I have been able to discover. Theobald recognized it two years after he discovered it, and unhesitatingly referred it to *E. macularius*, although, as has been already mentioned, the specimen is of uniform colour throughout.

This is a true *Eublepharis*, with the fingers and toes and eyelids of that genus.

It is distinguished from *E. hardwickii* by its finely granular skin, much more widely separated oval tubercles, and longer fingers. In *E. hardwickii* the large tubercles on the surface of the head are not separated by smaller ones, but are hexagonal and in close apposition, producing a tessellated appearance. In *E. macularius*, however, they are widely separated from each other by the granules as far forward as the front of the eye.

This form appears to be the western representative in India of *E. hardwickii*, which is spread over the eastern half of India from Madras to the south, and through Bengal to Chittagong. Two of the museum specimens of *E. hardwickii* are from Chaibassa; and I have since received a specimen from the neighbourhood of Calcutta.

DRACO DUSSUMIERI, D. & B.; Gthr. *l. c.* pp. 125, 126.

In three specimens from Travancore the scales have no trace of keels; and in one the membrane is strongly reticulated to the sides, the external portion being darkest, and bordered by a fringe-like band of lighter streaked longitudinally. In others the inner half of the membrane is almost immaculate and light-coloured. The pouch when distended is directed forwards at an acute angle to the long axis of the body.

JAPALURA VARIEGATA, Gray; Gthr. *l. c.* p. 133.

Japalura microlepis, Jerdon, Proc. As. Soc. 1870, p. 76 (female).
Japalura planidorsata, Jerdon, ibid. p. 76 (young).

I have examined twenty-one specimens of this species, of all ages and both sexes, from one locality; and after dissection I find that all the small-scaled individuals are females, and that those with a double series of very slightly enlarged keeled scales on the back on either side of the mesial line, separated from it by only one row of mesial scales, but on the neck by four or five, are young. At first I was near following Dr. Jerdon in regarding the small-scaled specimens with the dorsal double row of enlarged scales as specifically distinct from the large-scaled individuals; but further materials have led me to an entirely different conclusion. Mr. Gammie, however, to whom I am indebted for these specimens, collected at my request the supposed females of this species without determining the point by dissection; and on examining them I find that the sex of all his supposed females is correct. The question as it now stands may be stated thus: all the large-scaled Darjeeling *Japaluræ* which have hitherto come under my observation are undoubtedly males of *J. variegata*, while all the females of that genus from that locality only differ from *J. variegata* in having a mere rudiment of a dorsal crest, smaller scales, and a more sparing admixture of large ones. These characters are persistent in all the specimens of the sex that I have examined from that part of the Himalaya. The conclusion to be drawn from these facts is self-apparent, viz. that the large-scaled individuals are males of *J. variegata*, and that the small-scaled ones are the females; unless it so happens that there is another species, the males of which I have not as yet obtained—a supposition which seems improbable, as all the specimens were collected within an area of a few miles.

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* Journ. As. Soc. Beng. xvi. p. 633, and xxiii. p. 210.

Dr. Jerdon's small-scaled form, which he has named *J. microlepis*, has a reddish back, abruptly separated from the greenish colour of the sides by a series of somewhat raised scales.

I have received a specimen from Darjeeling agreeing with Dr. Jerdon's description of the coloration; but the lines of enlarged scales are prolonged into the red, and I cannot avoid thinking that in Dr. Jerdon's specimen they followed a similar arrangement, and that the appearance he describes may have been due to either one of two circumstances. I find in my specimen that on one side the enlarged scales do not pass on to the red surface, but they do so on the other side, where they are quite as well developed as in the adjoining green surface. On passing my finger roughly over these enlarged scales they are easily rubbed off, and no trace is left of them; and it seems probable that in Dr. Jerdon's specimens they may have disappeared from an analogous cause. Any way, however, the enlarged scales on the red surface are not so distinctly visible as on the green; and this is to be explained by the fact that they are generally pale-coloured on the green surface, and hence in strong contrast to it; while on the red they partake of a similar hue, and are thus much more indistinct. I attach no weight whatever to the red hue of the back; for this specimen agrees in every other point of its coloration with individuals which present no trace of it. It is highly probable, then, that this Lizard is endowed with the power of changing its colours quite as much as *Calotes*; and, indeed, the variations that occur in it seem only explicable by some such cause. I have carefully observed *Calotes versicolor* in confinement, and found it to undergo the most remarkable and almost sudden changes of colour while under the influence of fear or irritation; and on placing the specimens in spirit the colours are retained. It is a well-known fact, too, that the species of that genus are continually adapting their colours to the surfaces over which they may be hunting; and it is probable that they undergo chromatic changes depending on sexual causes. With these facts before us, and keeping in view the circumstances that all the other colours of this red-backed individual are those of the females of this species, the rufous coloration of the dorsal is utterly inadmissible as a specific character, and is due in all likelihood either to a sexual or to some adventitious cause.

My specimen with the red back measures 2″ 11‴; tail 4″ 6‴, imperfect. It is a gravid female.

Jerdon's *J. planidorsata*, as I have said, is founded on the young of this species, and in all probability on young females; for in the young males the dorsal crest is indicated, so that the term which he has applied to this supposed species would be inapplicable to them. They, however, have the rows of scales on either side of the dorsal line referred to by Jerdon, a character which is to a certain degree persistent in the adult, but which would be unlikely to catch the eye of the observer unless his attention had clearly been called to it in its much more interrupted character in the young. My specimens agreeing with Jerdon's *J. planidorsata* were from the same locality as the rest, and were sent as the young. Their heads have the peculiar full appearance so characteristic of that part in young Lizards; and the arrangement of the scales, large and small, and of the almost spiny scales on the nape, are the same as in the adults of *J. variegata*.

The females are much more dully coloured than the males; and even the specimen with the red back and tail has the general snake-hue of the others.

In one adult male the general colour of the body is light yellow, banded over the back and tail with broad black bars, reticulated on the limbs and sides with black; head above olive-brown, variegated on the vertex and sides with black. The band along the side of the neck is persistent in all, although not so well marked in the female. Another male with the general colour greenish, but banded and reticulated as is the previous one. In some specimens there is a distinct tendency to continue the neck-band along the side of the body, which would seem to connect this species with *J. swinhonis*, with which I am strongly inclined to consider it identical.

The females are much more darkly and indistinctly marked, and the bands between the black ones on the back are much duller and narrower than in males.

The molar dentition in the young is $\frac{12}{12}$ to $\frac{12}{14}$; and in the adults I have examined $\frac{15}{17} \cdot \frac{15}{17}$. The gular pouch is black.

There is another species of this genus which I have found in the Botanical Gardens, Calcutta. It is closely allied to *J. variegata*.

The Darjeeling specimens are all from an altitude of 3500 to 4500 feet.

SITANA MINOR, Gthr. *l. c.* p. 135.

This species is not uncommon in the Central Provinces. I have received twenty specimens from Udipur, Bilaspur, Nagpur, and Bandara; and in all the hind limb extends to beyond the snout, the fore limb extending to the vent when laid backwards. If the name given to the other species really indicates its habitat, it can hardly be said to inhabit more northern parts of India than the present species.

CALOTES VERSICOLOR, Daud.; Gthr. *l. c.* p. 140.

Darjeeling, 3800 to 4000 feet.

CALOTES MARIA, Gray; Gthr. *l. c.* pp. 144, 145.

Garo Hills.

CALOTES MYSTACEUS, D. & B.; Gthr. *l. c.* p. 141.

Garo Hills.

OREOTIARIS TRICARINATA.

Calotes tricarinatus, Blyth, Journ. As. Soc. xxii. p. 650.

Tiaris elliotti, Gthr. Proc. Zool. Soc. 1860, p. 151, pl. xxv. fig. B.

Oriotiaris elliotti, Gthr. Ind. Rept. p. 150.

?*Calotes tricarinatus*, Blyth; Gthr. Ind. Rept. p. 144.

I have compared Blyth's type of *C. tricarinatus* with Gunther's figure and description of *T. elliotti*, and can detect nothing by which to separate them. My specimen was from an elevation of 6000 feet in the neighbourhood of Darjeeling. The type and the latter measure:—

Total length.		Tail.	
in.	lin.	in.	lin.
5	9	4	0
5	6	3	8

TIARIS SUBCRISTATA, Blyth; Gthr. *l. c.* p. 151.

Stoliczka has given a full description of this Lizard and of its variations, and has pointed out that it is identical with Fitzinger's *Coryphophylax maximiliani* as adopted by Steindachner in his 'Reptiles of the Novara Expedition.'

It is an arboreal Lizard common in the Andamans, and more so in the Nicobars. Dr. Stoliczka has examined 100 specimens from the latter locality, and finds them, as already said, to be identical with those from the Andamans.

UROMASTIX HARDWICKII, Gray.

I quite agree with the remarks which have fallen from Mr. Theobald* regarding the systematic position which had been assigned to the genera *Uromastix*, *Liolepis*, and *Phrynocephalus* before he proposed to group them under one very natural family, the Uromasticidæ.

This appears to be a very common Lizard in the dry district of Agra, and also throughout the Punjab and Scind, in all of which localities they are esteemed as an article of food.

Mr. Theobald gives some interesting observations on its habits. It is a ground-Lizard, burrowing in sandy soil, and of a very gentle and placid disposition, and herbivorous. He observed that it never left its burrow till the sun was up, and that it grazed in front of it for some hours, and retreated during the intense heat of the midday sun. In the evening they reappear, and finally retire as the dark comes on, or earlier if it is chilly. They seem, he continues, sensitive to climatic changes and carefully close their burrows with sand, so that they escape notice unless searched for.

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* Cat. of Reptiles in the Mus. As. Soc. Bengal, 1868, p. 30.

My largest specimen out of five measures, body $6\frac{7}{8}$ inches, tail $5\frac{2}{8}$; and all have the large black spot on the inner side of the thigh.

CHARASIA DORSALIS, Gray.

The verticillate arrangement of the scales of the tail is not well seen in any of the specimens in the museum, although their transverse disposition on the body is very distinct. The number of large scales along the side of the chin varies from three to five. The young is pale brown, with three broken transverse dark brown bands, one over the nape and two behind the shoulder, with about fifteen on the tail.

Hab. Chita, Nagpore district, Raipur, Southern India, Mysore, Bangalore, Nilgherries to 6000 ft. (*Gthr.*), and Pind Dadun Khan. Its occurrence in these widely separated localities indicates that it is generally distributed over India proper.

TYPHLOPS BOTHRIORHYNCHUS, Gthr. *l. c.* p. 174.

This specimen agrees in every particular with Günther's description of the type. It measures 10 inches in length. I received it from the Garo Hills.

TYPHLOPS HORSFIELDII, Gray.

Length $13\frac{3}{8}$ inches.
Nazeerah, Assam.

OLIGODON DORSALIS, Gray; Gthr. *l. c.* pp. 210, 211.

This specimen is a female, with 188 ventrals and 37 caudals; the total length $11''\ 8'''$, the tail $1''\ 6'''$.

Fifteen rows of scales. Rostral wedged in between the anterior frontals, which are transversely elongated; a deep transverse crescentic groove on its under surface. Posterior frontals large, broader than long, pentangular, prolonged on to the side of the head, forming a moderate-sized suture with the loreal and præocular; vertical shield-shaped, hexagonal, broad in front, as large as an occipital, Occipitals obliquely truncated in front. The nasals are completely united; but the position of the suture is indicated above. A moderate-sized quadrangular loreal. One præ- and one postocular. Temporals 1 × 2. Seven upper labials, the third and fourth entering the orbit. Two pairs of chin-shields, the anterior pair nearly twice as large as the posterior, succeeded by two pairs of scale-like shields. Lower labials six; the first pair form a broad suture behind the mental; the second is very small, and the third very large.

General colour brown, minutely spotted with black. Rostral shield with a black centre and yellowish-brown margin. A black band on the anterior and posterior frontals and anterior third of vertical, passing downwards through the eye to the upper labials, where it expands into a large subocular black spot. A broad black band over the occipitals to the angles of the mouth, where it is minutely punctulated with yellowish. A pale yellowish-brown vertebral band, the breadth of three rows of scales, prolonged along the body to the tip of the tail. It is interrupted at the base and near the tip of the tail by two large black spots. A longitudinal series of small black spots at intervals of four transverse rows of scales along the sides of the pale vertebral band. A narrow black longitudinal band along the sides of the body on the second and third rows of scales above the ventrals. Ventrals pale yellow, with large deep-black quadrangular spots, so confluent that black is the prevailing colour. Under surface of tail pale orange-yellow, with the black yellow-punctulated spots confined to the external margins of the caudals.

This specimen is from the Khasi Hills; and as Griffith travelled in that region and in the hilly country to the north of it, it is most probable that the specimen found in his collection came thence, and not from Afghanistan as Günther supposes.

SIMOTES RUSSELLII, Daud.; Gthr. *l. c.* p. 213.

Loc. Singhbhoom.

SIMOTES PUNCTULATUS, Gray; Gthr. *l. c.* p. 217.

Five specimens, all of a deep brick-red, with narrow transverse light brown bands with black margins; the lines and their margins do not exceed two scales' breadth. In some the spots on the ventrals are so numerous and confluent that the plates are almost wholly black. The ventrals of the smallest specimen, 26″ 6‴, in the two posterior thirds of the body, are full coralline-red, with their surfaces more black-marbled than black-spotted, and there is a distinct tendency to the formation of a white line along the angles of the plates.

Three other specimens of this species, from Darjeeling, belong to the dark brown variety, with light brown black-edged bands and with darkish underparts. In two the præorbitals are confluent.

I have three specimens from Darjeeling corresponding to Günther's variety β. In one there are two præoculars on one side, and one on the other.

Brick-red variety.

The specimens measure :—

No.	inches.	Ventrals.	Caudals.	Bands.
1	36½	210	58	34
2	32¾	194	66	31
3	32½	196	56	33
4	30½	201	62	29
5	26½	195	66	30
6	9⅞	198	55	

None of these specimens show any tendency to division of the præorbitals.

All from an elevation of 3500 feet.

Dark blackish-brown variety.

	No.	inches.	Ventrals.	Caudals.	Bands.
Var. *a.*	1	32½	198	68	26
	2	?	196	63	28

No. 2 is uniform dark brown, with all the scales and angles of the ventrals and caudals minutely dotted or speckled with the same colour, with twenty-eight pale brown transverse narrow black-edged bands. The posterior two-thirds of the body, excluding the tail, have the ventrals entirely black, with the exception of a narrow longitudinal line on the keel. The angle, too, of every alternate or third ventral is blacker than the intervening ones. The anterior third of the body and the caudals are squarely black-spotted; but the angles are marked in the same way as the posterior two-thirds.

No. 4. This specimen is uniform blackish brown, with twenty-seven almost black spots with still darker margins. The first two on the neck are in pairs and side by side, but those behind them are united in figures of eight placed transversely; they are very indistinct and can only be seen in certain lights. On either side of them there are faint indications of other black spots, the remnants, as it were, of the transverse bands of the other forms.

The under surface on its two posterior thirds, excluding the tail and anterior third of the body, is deep black, with a white longitudinal line along the keel of every alternate or third caudal, the angles of the intermediate ones being entirely black.

SIMOTES BICATENATUS, Gthr. *l. c.* pp. 217, 218.

Nineteen rows of scales. Loreal quadrangular, as high as broad. Two præoculars, the uppermost much larger than the one below it, and widely separated from the vertical. Two postoculars. Seven or eight upper labials; in the former case the third and fourth entering the orbit, in the latter the fourth and fifth. Temporals 2 + 2, one in contact with the postoculars. Vertical broad, nearly as large as an occipital. Occipitals transversely truncated. Ventral shields distinctly keeled. Ventrals 169–173. Subcaudals 43–63.

Colour light brown above, with three rather indistinct darker longitudinal lines, one along each side of the body on the third and fourth outer series of scales, and the other along the vertebral line. Head with the markings of the genus. Under surface yellowish, with faint indications in one specimen (Calcutta) of a brown spot near the lateral edge of each ventral, with a few brown scattered spots on the centre of the ventrals and subcaudals posteriorly. In another specimen (Garo Hills), agreeing with the former in all its structural details, the lateral spots on the ventrals are strongly marked on the two anterior thirds of the body, and on the posterior third they are so large and intense as to become confluent. Under surface of tail nearly immaculate.

The only difference that I can detect between these specimens and Günther's type of the species is the presence of two anterior temporals; but such a character is not of itself sufficient to entitle us to separate species.

Hab. Calcutta, rare; foot of Garo Hills.

ABLABES RAPPII, Gthr.

Eight specimens of this Snake, collected in five weeks, would seem to indicate that the species is not uncommon at Darjeeling. The specimens form two varieties; and the colouring is wonderfully uniform in all. The very young specimen has a broad intensely black collar; and the rest of the upper surface is pale greyish brown. The collar is perceptible in all the adults.

No.	Length.	Tail.	Ventrals.	Caudals.
1	$20\frac{7}{8}''$	$4\frac{4}{8}''$	190	60
2	$18\frac{6}{8}$	$4\frac{6}{8}$	190	75
3	$18\frac{2}{8}$	$4\frac{2}{8}$	194	65
4	$17\frac{6}{8}$	$3\frac{3}{8}$	198	50
5	$18\frac{1}{8}$	$4\frac{1}{8}$	191	73
6	$15\frac{4}{8}$	$3\frac{5}{8}$	190	71
7	$13\frac{6}{8}$	$3\frac{2}{8}$	190	77
8	$7\frac{4}{8}$	$1\frac{5}{8}$	196	70

Darjeeling, 3200 to 4500 feet. From the steep slopes of the Jurta valley.

ABLABES COLLARIS, Gray; Gthr. *l. c.* p. 228.

Total length.	Tail.	Ventrals.	Caudals.
$29\frac{6}{8}''$	*$8\frac{6}{8}''$	175	88
$23\frac{6}{8}$	*$5\frac{7}{8}$	180	73
$18\frac{6}{8}$	*$3\frac{6}{8}$	177	54
$15\frac{6}{8}$	$4\frac{6}{8}$	180	106

This is not uncommon at Darjeeling at elevations between 3000 and 4000 feet. I have also received it from the Garo Hills.

TRACHISCHIUM FUSCUM, Blyth; Gthr. *l. c.* p. 225.

I have lately received three specimens of this Snake from an elevation of 5550 feet on the Darjeeling Himalaya.

Total length.	Tail.	Ventrals.	Caudals.
$14\frac{2}{8}''$	$1\frac{4}{8}''$	156	30
$12\frac{1}{8}$	2	161	43
$11\frac{1}{8}$	$1\frac{2}{8}$	141	34

The first specimen has the elongated loreal divided into two on each side. The colour is uniform metallic black, with an iridescent lustre. The third specimen has the centre of the ventrals of a pinkish brown, paling in their posterior margins to a lighter pink. The angles, however, of all of these shields are deep metallic black, and the pinkish centres are more or less speckled with the same colour.

The short, rather blunt tail of this Snake, its single posterior frontal, and thirteen rows of scales would seem to indicate that it is generically distinct from *Ablabes*.

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* Tails imperfect.

Hab. Himalaya (Eastern), not uncommon at elevations varying from 3000 to 7000 feet.

COLUBER PORPHYRACEUS, Cantor; Gthr. *l. c.* p. 239.

Fresh specimens, in spirit, are a bright brick-red on the sides, slightly darker above. On the posterior two-thirds of the body the cross bands are not darker than the general colour; and their total number is twenty. This specimen measures 36 inches, of which the tail forms $5\frac{1}{2}$ inches. In other individuals, from the same locality as the former, measuring $32\frac{2}{8}$ inches, and the tail $5\frac{4}{8}$, the cross bands are distinctly darker than the ground-colour, and are twenty-one in number; but eight of them, in the middle and posterior portion of the body, are reduced to mere lateral spots. In another specimen, measuring 22 inches, of which the tail forms $3\frac{6}{8}$, the colour is brownish olive, and there are twenty-three cross bands, markedly distinct from the general colour of the snake. Eight of the cross bands before the tail are reduced to lateral spots. In these four specimens from Darjeeling Himalaya, from altitudes varying from 3000 to 5000 feet, the following numbers prevail:—

Ventrals.	Caudals.	Bands.
210	65	17
208	52	21
215	69	24
208	63	19

COMPSOSOMA RETICULARE, Cantor; Gthr. *l. c.* p. 245.

Coluber fasciolatus, Blyth, Journ. As. Soc. Bengal, xxii. p. 409.

Zamenis fasciolatus, Theobald, Cat. Rept. As. Soc. Mus. 1868, p. 53.

Head not very distinct from neck, long and flat. Snout long and broad, rounded in front; rostal variable, considerably broader than high, or as high as broad. Anterior frontals subquadrangular or almost triangular, broader than long, less or more than half the size of the posterior frontals; posterior frontals quadrangular. Vertical longer than the occipital suture; frontal as broad as or slightly broader than superciliary margin; occipital margins meeting nearly at a right angle; superciliary margins moderately convergent, slightly concave in some. Extreme length of occipitals equals vertical and one-third of posterior frontals; obliquely or nearly transversely truncated or rounded behind. Loreal almost square, or nearly twice as long as broad, with four sides; the one in contact with the præocular nearly as long as the one in contact with the second and third labials, the other two sides being about half the size of them. Præocular large, reaching to the upper surface of the head, but widely separated from the vertical.

In some specimens from Darjeeling a small portion is separated from the third labial as a supernumerary præocular. Two first oculars, the lower one resting on the suture of the fifth and sixth labials, and both in contact with two other elongated temporals. Temporals 2+2, or 2+3, or 2+2+3. Eight upper labials, the fourth and fifth entering the orbit; ten lower labials. Two pair of chin-shields; the anterior pair considerably larger than the posterior pair, in contact with five labials; the posterior pair separated by two small scales. Nineteen rows of scales, not elongate; those on the dorsal surface faintly keeled, those on the sides smooth. Ventrals with distinct indications of a keel, and bent up the side; anal entire; ventrals 222 to 232; caudals 68 to 76. General colour dark olive-brown, many of the scales with pale or white margins, on the intervals between a double series of vertebral dark olive-brown spots that coalesce a short way behind the neck into a vertebral series of large black figure-of-8-like spots connected with each other on either side by a faint dark lateral line of the breadth of two scales. On the third and fourth series of scales from the ventrals there is a longitudinal line of elongated black spots with light centres, connected with each other by loops, like the links of a chain. Both these and the dorsal line of spots, which commence about half an inch behind the head, disappear about the middle of the body, the lateral line being only represented by ill-defined short black lines. The white edgings, however, to certain of the scales remain, and become gradually defined, from before backwards, into transverse white or brick-red lines, with black margins, which become most marked on the hinder quarter of the trunk and on the tail. The under surface anteriorly is yellowish, especially bright on the upper labials and chin; but it is irregularly marked anteriorly with black spots, which become more diffused posteriorly until the whole of the under surface becomes almost black.

In a rather young specimen from Darjeeling the rostral is decidedly broader than high, while in a Garo-Hill specimen it is as markedly higher than broad.

One specimen has the posterior frontals confluent; and another has them united throughout half their extent, while a third has one of the anterior frontals partially divided.

In one specimen a very small portion of the first labial on one side is separated as a labial; and the inferior præocular on the same side appears to be a separated portion of the third and fourth labials, as its upper margin is marked by a slight notch in its middle, thus indicating its twofold character.

I have also indicated in the above description the variations observable in the other head-shields. The Darjeeling specimens have usually more triangular than quadrangular loreals and præfrontals, and more elongate loreals than those from the Garo Hills; but the similarity of the specimens from both these localities is so marked that it would be unjustifiable to separate them.

Mr. Theobald included *Zamenis fasciolatus* under this species. The specimen was from Southern India; but I have since received examples from the neighbourhood of Calcutta agreeing with it in every particular.

The coloration is wonderfully persistent.

My Darjeeling specimens measure:—

Total.	Tail.	Ventrals.	Caudals.
58″ 0‴	9″ 9‴	229	69
55 8	9 6	232	68
49 10	8 10	222	72
51 0	9 6	230	76
46 2	8 6	228	77
40 3	6 10	228	73
45 9	6 3	227	70
15 0	2 6	225	72

This species is not uncommon at Darjeeling, between 3000 and 4000 feet; and I have specimens from the Garo Hills. Blyth's were from Darjeeling; and the type of Cantor's description was from Cherra Pungee.

CYNOPHIS HELENA, Daud.; Gthr. *l. c.* p. 247.

I obtained a fine specimen of this Snake in the same locality with *D. forsteni*, var. *ceylonensis*. It measures, body 31″ 4‴, tail 7″ 3‴. Ventral shields 244, subcaudals 77; anal entire. The fifth and sixth labials enter the orbit; and the posterior angle of the fourth all but touches it; the præocular touches the vertical. A few spots on the sides of the ventrals, the angles of which along the whole length of the body are ashy brown. The ventrals generally, with the exception of those on the anterior eighth of the body, are minutely mottled with ashy brown. With this exception, this specimen agrees in every other particular with Günther's description.

PTYAS KORROS, Reinw.

A young specimen, 13$\frac{2}{5}$ inches, with about one inch of the tail wanting. Fifteen rows of smooth scales, without any trace of keels or any of the vertebral ones, with a pair of apical grooves. The two large loreal shields have a minute one between, evidently a separated portion of the anterior one. All the other characters agree with this species. V. 187, C. 64 (imperfect). Blackish brown above, with numerous narrow transverse white lines formed by the margins of the scales on the anterior half of the body, dull white below.

Hab. Nazeerah, Assam.

This museum possesses a specimen of this Snake from Darjeeling; so that its known range is from Java to the last-mentioned locality.

ZAMENIS DIADEMA, Schlegel; Gthr. *l. c.* p. 252.

Seven specimens, of different ages, from Agra, Bhurtpore, and Dholepore, have only twenty-seven rows of scales and from nine to thirteen upper labials. In the majority the præocular is divided or partially divided into two. The imperfectly divided shields appear to be characteristic of the young. Anterior frontals are larger than the posterior, and separated from the vertical by four shields, the outer of which are generally the largest. Loreals usually three; when a fourth occurs it is very small, and is evidently a separated portion of one of the other three. A ring of small shields surrounding the lower and hinder parts of the orbit; temporals scale-like; a distinct ridge along the sides of the abdomen; anals sometimes showing a distinct tendency to division.

No.	Length total.	Tail.	Ventrals.	Caudals.
1......	64″	$13\frac{1}{4}$″	247	93
2......	$62\frac{2}{8}$	11*	246	89*
3......	$60\frac{5}{8}$	$12\frac{1}{2}$	245	99
4......	$58\frac{1}{4}$	9*	246	64*
5......	$42\frac{1}{2}$	$9\frac{3}{4}$	237	108
6......	$40\frac{1}{4}$	$8\frac{1}{8}$	249	105
7......	$34\frac{2}{8}$	$7\frac{1}{8}$	245	104

Nos. 1, 2, and 3, adults; the head is all black with metallic lustre as far as the occipitals, with or without a short narrow notched band prolonged backwards for about one inch. As age advances, the black appears to involve not only the whole upper surface of the head, but to stretch backwards even beyond the gape. In adolescents the black does not extend in front of the eye, but backwards as a broad temporal band, and it sometimes stretches backwards for about an inch as a narrow vertebral band. In the young specimens from Bhurtpore and Dholepore, not many miles to the east of Agra, there is a black spot on each shield, a broad interorbital one connected by a short narrow mesial band with a large black spot on each occipital, which are connected with the band at the anterior extremities; a short vertebral band from the occipitals, and confluent behind with the first dorsal spot; a black band through the upper loreal and præocular, and through the eye from the postoculars to the gape; an interrupted black band through the labials.

In adults the ground-colour is uniform bright pinkish red, with a dash of olive-brown, especially on the hinder parts; under surface rich pinkish; a dorsal series of round metallic black spots, with two series of longitudinal broken lines of the same colour along the side, sometimes forming round spots with smaller scattered ones between them and the angles of the ventrals on which they also occur. The under surface is sometimes covered with large black spots, but in others it is without any trace of them. In one specimen even the dorsal spots are restricted to one scale, and the ventral spots all but disappear.

In one young specimen, No. 7, the ground-colour was brownish olive, with a dorsal series of brown spots slightly edged with metallic black.

This species is highly characteristic of the dry and rather arid country of the North-west Provinces, where it appears to be not uncommon.

Although the rows of scales are only twenty-seven, the præocular is usually divided into two, and does not invariably reach the vertical; the upper labials vary from nine to thirteen; and the anal in two specimens is distinctly partially divided. There can be no doubt that all of these specimens belong to this species, which appears to

* Imperfect.

be a very variable one, and to become much modified by age in the character of the colouring of its head and body.

This is the Snake commonly seen, along with *Eryx johnii*, in the possession of the snake-charmers of the North-west Provinces.

ZAMENIS BRACHYURUS, Gthr. Ann. & Mag. Nat. Hist. ser. 3, xviii. p. 27; Blanford, Journ. As. Soc. Beng. 1870, p. 372.

I have one specimen of this Snake from the S.E. Berars, agreeing in every particular with the description of the type, except that the colouring appears to be a little darker, which may be explained by the circumstance that it reached me shortly after its capture, whereas Günther's type had in all probability been a much longer time in spirit.

TROPIDONOTUS QUINCUNCIATUS, Schleg.; Gthr. *l. c.* p. 260.

Four postoculars on one side, and three on the other. The fourth is a separated portion of the fourth and fifth upper labials.

Hab. Nazeerah, Assam, Agra.

The Agra specimen was chequered with bright red and olive-green when alive.

TROPIDONOTUS STOLATUS, L.; Gthr. *l. c.* p. 267.

Hab. Nazeerah, Assam.

TROPIDONOTUS PLUMBICOLOR, Cantor; Gthr. *l. c.* p. 272.

I procured a specimen of this species about twenty miles to the west of Galle, in Ceylon.

The only particular in which it differs from the continental form is, that the under surface instead of being blackish is a dirty olive.

Length of body 10″, tail 1″ 9‴. Ventrals 154; subcaudals 44.

TROPIDONOTUS PLATYCEPS, Blyth; Gthr. *l. c.* p. 264.

The dentition of Blyth's type and my specimens is 14+2, enlarged teeth behind separated from each other by a distinct interval, and not 10 as stated by Günther. The enlarged teeth are two in number, and in a special sac.

In Blyth's type one specimen has three postoculars on both sides, the two lowermost ones in contact with two temporals; while the other specimen has a like arrangement on its right side, but only two postoculars and one anterior temporal on its left. My specimens show like variations of the postocular and temporal shields, as follows:—

	Number of postoculars.		Number of temporals anteriorly.		Temporals in contact with oculars.	
No.	Right.	Left.	Right.	Left.	Right.	Left.
1	3	3	1	2	2	2
2	3	3	1	1	2	2
3	3	3	2	2	2	2
4	3	3	2	2	2	2
5	3	3	1	1	2	2
6	3	3	1	1	2	2

From these observations it would appear that the normal number of the postoculars of this species is 3+3, and that the temporals vary between 1+2+3.

No.	Length.	Tail.	Ventrals.	Caudals.
1......	$30\frac{3}{8}''$	$8\frac{3}{8}''$	180	100
2......	$32\frac{3}{8}$	$9\frac{4}{8}$	200	105
3......	$28\frac{3}{8}$	$5\frac{7}{8}$*	195	65*
4......	$27\frac{4}{8}$	7	197	95
5......	$24\frac{4}{8}$	$3\frac{5}{8}$*	205	45*
6......	$17\frac{3}{8}$	$4\frac{1}{8}$	200	90

The coloration of these specimens agrees in every particular with Dr. Günther's description, with this exception, that some of the specimens have the ventrals finely speckled with black spots.

Darjeeling, 3500 to 5000 feet, common.

TROPIDONOTUS MACROPHTHALMUS, Gthr. *l. c.* p. 262.

Three specimens, resembling Günther's figure and description in every respect. One of the adults, however, is a reddish brown with the dorsal series of spots pale reddish brown. In the young the anterior third has a dorsal and two lateral series of spots placed alternately to each other and connected by narrow lines enclosing scales with white margins; its head is slightly green above; and it has the arrow-shaped mark on the neck; and the posterior third of the body is coloured as in the adults.

No.	Total length.	Tail.	Ventrals.	Caudals.
1	$43\frac{3}{4}''$	$8''$	173	59
2	$41\frac{1}{2}$	$7\frac{1}{4}$	175	64
3	$18\frac{1}{2}$	$3\frac{1}{2}$	168	79

Hab. Darjeeling, Sikkim, 4000 to 5000 feet, and Salsanger, Assam.

I have since had three other specimens of this well-marked species under my observation; and in one there are only two postoculars on one side, while there are three on the other; so that we may expect to meet specimens with two postoculars. Another has only seven upper labials on one side and eight on the other; and this abnormality is evidently due to the union of the third and fourth, for the third is much larger than in normal heads. In a young specimen of this set there is a large black arrow-shaped mark on the nape of the neck, and not visible on the two other adult specimens. The yellow collar forms a narrow line before this. In the young the lateral spots are entirely black, round, and surrounded by a well-defined, pale, circular area, which is connected with the corresponding area round the spot on the opposite side by a pale transverse band.

This species does not appear to be uncommon at Darjeeling.

TROPIDONOTUS SUBMINIATUS, Reinw.; Gthr. *l. c.* p. 265.

In two specimens which I refer to this species there are nine upper labials, evidently resulting from the division of the third; and in one of them there are only two postoculars, resulting from the union of the two lower shields. One of these specimens is from Nazeerah, Assam, and the other from Darjeeling. All the other shields of the head are normal, with the exception of the occipitals, which are obliquely truncated behind in the Darjeeling specimen. Both have the pale area round the eye, the black streak between the fifth and sixth labials, and the black spots along the sides of the ventrals. In the Darjeeling specimen, measuring 25″ 2‴ in length, the yellow collar is very distinct, and the scales behind it for some distance have brilliant coral-red margins, interspersed with others narrowly margined with black, and arranged in a kind of zigzag manner, which is continued all over the body, the coral-red being lost on the posterior fourth of the body and its place taken by brilliant yellow. The general colour of the scales, however, is uniform greenish olive; and their bright colours are only seen where the scales are pulled aside, when the colours are found also to involve the skin as well.

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* Tail imperfect.

This is a very common species in Darjeeling and also in Assam, and it is usually found at elevations of 4000 feet and upwards.

Tropidonotus himalayanus, Gthr. *l. c.* p. 265.

Two specimens from Darjeeling agree in every particular with this species, except that one of them has a small portion of the upper anterior margin of the temporal separated as a small shield, less than one-fourth the size of the parent shield. In this specimen the quadrangular spots are brilliant brick-red, and the general colour of the anterior part of the body is greenish olive-brown. The yellowish variegation of the anterior part of the body described by Günther is brilliant coral-red in fresh specimens.

Total length.	Tail.	Ventrals.	Caudals.
24″ 3‴	6″ 2‴	174	86
35 3	8 6	176	86
29 9	Imperfect.	170	?

The third specimen has been lately received from the same locality, but, although it agrees with all the other characters of this species, it has only seven upper labials, the third and fourth of which enter the orbit.

Hab. Darjeeling, 3200 to 4000 feet.

Cantoria dayana, Stoliczka, Journ. As. Soc. Beng. vol. xxxix. p. 208.

Body much elongate, neck very slightly contracted. Head rather flat, obtusely rounded in front; eye very small. Rostral as high as broad, pointed above; upper lateral margins concave. Single præfrontal wedge-shaped, with its pointed extremity directed forwards in contact with the rostral. Nasals large, with the nostrils placed behind their middles; posterior frontals of moderate size, scale-like, nearly as large as the nasals; vertical broad, shield-shaped, hexagonal; superciliaries rather small; occipitals narrow and long and rounded posteriorly. Loreal nearly square, in contact with first, second, and third upper labials. One præocular, widely separated from the vertical, resting on the third labial; two postoculars, the lower one long, resting on the third and fourth labials. One single much elongated temporal in contact with the postoculars, succeeded by a large scale-like shield. Five upper labials, all excluded from the orbit by the oculars; eight lower labials, the front pair forming a suture behind the mental. Two pairs of chin-shields in contact with each other, the anterior pair in contact with four labials; nineteen rows of smooth, moderately elongated scales. Ventrals narrow, 268; anal bifid; subcaudals two-rowed, fifty-six. General colour dull yellow; tip of snout bluish black; a broad black band between the eyes involving the oculars, vertical, and occipitals, and a black band from behind the angle of the mouth across the occiput, involving one temporal; all the rest of the head of the same yellow colour as the body generally; forty-nine large bluish-black spots or bars on the back, contracting to a point on the sides and only passing halfway down them, sometimes confluent on the back; twelve black rings encircling the tail and occasionally confluent above and below. Teeth four in each jaw, the posterior one the largest, enclosed in a distinct pouch and indistinctly grooved.

Hab. Amherst, near the mouth of Moulmein river.

As remarked by Dr. Stoliczka, this species has a very marked resemblance in coloration to *Hipistes hydrinus*; and, as is well known, both of these Snakes, as also others of the Homalopsidæ, appear to mimic the true Hydrophiidæ.

I think there can be no doubt that Cope's recognition of Peters's *Hydrodipsas* as *Cantoria* is correct.

CERBERUS RHYNCHOPS, Schneid.; Gthr. *l. c.* p. 279.

This is not an uncommon species in Lower Bengal; and it appears equally to frequent fresh and salt water; for I have specimens from localities on the Hoogley ninety miles from the sea, and beyond the influence of the tides, and even as far inland as Burrakur, about 120 miles in a straight line from the sea, while there are others in this museum from the coasts of the Andaman Islands and Burmah. It has also been obtained in the Nicobars. *Ferania sieboldii* seems to have a similar power of accommodating itself to fresh and salt water, and to have even a more extended inland distribution than the present species; for Carlleyle has more than one specimen from Agra, more than 1000 miles from the sea.

The shields of the head are subject to considerable variation, and in one specimen from the Hoogley the nasal shields are confluent into one, which forms a broad suture with the rostral; there are, however, faint indications of the compressed character of this shield. In four specimens from different localities, Akyab, the Hoogley, and Amherst on the coast of Burmah, there are two infraoculars. The upper labials are also subject to variation depending on the extent of the division that prevails among them.

The Bengal and Amherst specimens have all twenty-five rows of scales. A female from the Hoogley, measuring 39″ 6‴, and the tail 6″ 9‴, contains twenty-five fully developed young; eighteen of them have two infraoculars, only five have one infraocular; one has two infraoculars on one side and only one on the other, and in another the infraocular is confluent with the lowest postocular. In none are the nasals confluent; and all have twenty-five rows of scales. The teeth are wonderfully well developed for the size of the young, which on an average measure 7″ 10‴ in total length, the tail measuring 1″ 6‴. This female has 143 ventrals; caudals 56. In the adults of this species that have come under my observation, there has always been a narrow black longitudinal band from behind the eye along the side of the neck to the first black cross bar. In the young this band commences from the tip of the snout, and passes through the eye and further along the neck than in the majority of adults. There are also in the young a short, narrow, longitudinal black line on each side of the ventral line, on the nape of the neck, and a black spot on each superciliary. The upper labials are only as it were dusted with brown, while the chin and lower labials are spotted with black. There are a series of black spots along the side and more or less connected with the cross bars, which are very indistinct and imperfect in by far the majority. The black on the ventral aspect is very intense, and prolonged up the sides.

It is a curious fact that all these young specimens *in utero* were shedding their skins.

FERANIA SIEBOLDII (Schlegel); Gthr. *l. c.* p. 284.

Homalopsis sieboldii, Blyth, Journ. As. Soc. Beng. xxviii. p. 297.

Feranoides jamnætica, Carlleyle, Journ. As. Soc. Beng. xxxviii. p. 196, figs. 3 & 4.

This specimen was caught in the Jumna at Agra, and it is identical in every particular with another specimen before me from Pegu. Both have twenty-nine rows of scales, as originally described by Schlegel*, and afterwards by Duméril and Bibron. Dr. Günther, however, restricts the number of scales to 27; ventrals 155, caudals 52.

Pupil vertical; rostral five-sided, broader than high; anterior frontals small, transversely triangular, half as large as posterior; vertical nearly as long as occipitals, longer than broad, with the lateral margins slightly concave (in both specimens), and a right angle behind; occipitals obliquely truncated or slightly rounded behind; loreal rather quadrangular, lying in the sutures of the first two or three upper labials, nearly as large as first temporal and almost touching anterior frontals (in contact on one side in Pegu specimen). Præocular narrow, high, resting on suture of third and fourth upper labials, and reaching the upper surface of the head; two postoculars, the lowest the larger, lying on sutures of fourth and fifth and fifth and sixth labials. Temporals 1 + 2 + 3. Upper labials eight, the fourth entering the orbit, the seventh and eighth split into two pieces; thirteen lower labials, the sixth the largest, and the last five very small. One pair of large chin-shields, in contact with four labials; posterior shields small, scale-like, the first pair intercalated between the large anterior pair and the fifth and sixth lower labials; six transverse rows of scales between the first ventral and the last chin-shield. Thirty-four large broad black-edged spots passing down on either side to the third or fourth row of scales from the ventrals, with a triangular dark brown almost black spot between them and their extremities; the under surface and sides yellow, the former chequered with black; ground of upper surface pale brown.

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* Essai s. l. phys. Serp. tome i. p. 172.

I make out seven equal teeth, and one large grooved tooth behind.

There is a reference to this Snake in the Proc. As. Soc. of Bengal, March 1869, p. 105, and in the Journal of the same society, part ii. 1869, p. 196. It is described as a new genus and species, *Feranoides jamnæatica*, Carlleyle. In a footnote, the editor remarks that it is one of the rare instances among the Homalopsidæ of a Snake with a round pupil, and that its dentition is peculiar. However, as these remarks were founded on an imperfect drawing, their inaccuracy is not surprising.

My specimen has a vertical pupil, as stated; and the dentition is that of *Ferania*.

Mr. Carlleyle, of the Agra Museum, who procured this Snake, states that he got at Allahabad last year four living Snakes which he thinks might be classed along with this species. It is probable that this Snake may not be so rare as was at first supposed.

HIPISTES HYDRINUS, Cantor; Gthr. *l. c.* p. 287.

This species has a very strong resemblance in the character of its colouring to the Hydrophiidæ, perhaps even more so than any other of the Homalopsidæ. The discoverer of this genus directs particular attention to the peculiar character of the rostral, which is marked in front by one small and two lateral depressions, the latter being placed immediately above two grooves on the under surface of the rostral, continuous with the palatal furrow. He describes the projecting anterior portion of each groove as a tubercle, while in reality it is not more than the forward projection of the fold of the rostral constituting the groove; and he regards this as the mechanical contrivance by which this Serpent, like the Hydrophiidæ, is enabled hermetically to close its mouth. The nasal is certainly not nearly twice as large as the posterior frontals, and can only be described as being smaller. The lower præocular is fully three times the size of the other. The occipitals are much broken up. There are two pairs of chin-shields as described by Cantor, the front pair very much larger and longer than the posterior one, and in contact with six labial shields. The eye, which is placed almost on the upper surface of the head, has a vertical pupil as in *Ferania*, *Cantoria*, and *Cerberus*, and is very small and is slightly external to the line of the nostrils. There are seven teeth in the upper jaw—the first or rather short curved tooth, succeeded by three other short stout teeth, followed by two other very long slender teeth; and the series is completed by a strong grooved tooth in a special sack. The first two palatal teeth are very much longer and stronger than the others, and nearly eqnal the longest maxillary teeth. One peculiarity of the arrangement of the scales in this genus is their elevation, as it were, above the skin, and the circumstance that the tip of one scale, although it reaches forwards, rests on and between the middle of the pair anterior to its tip, barely reaches beyond the scale in front, and rarely touches it. The result is that there is the appearance produced as if there were a kind of pit or depression at the base of each scale, an appearance which is heightened from the circumstance that the base of each scale is black. The strong keeling of the ventrals is another peculiarity of this interesting genus.

Length.	Tail.	Ventrals.	Caudals.
21″ 2‴	1″ 5‴	165	27
16 0	1 1	165	23

The general colour of the lower half of the Snake is pale yellow, the upper surface being ashy grey with a few scattered spots on the neck, the back and tail with about fifty-seven or fifty-eight transverse black bands.

Two of Cantor's three specimens were captured in fishing-stakes in the sea off the coast of Keddah; the third was washed ashore at Pinang. Dr. Stoliczka* describes this Snake as common at the mouth of the Moulmein river, especially near Amherst, and seems inclined to regard it more as an inhabitant of brackish than salt water. Its discoverer describes it as moving actively and without difficulty over the sand, and that it did not offer to bite; but Dr. Stoliczka remarks that it is very fierce—an opinion which the Burmese appear to share with him.

PSAMMOPHIS CONDANARUS, Merr.; Gthr. *l. c.* p. 291.

This specimen agrees with all the structural details as given by Günther, but not with his description of the colour. This specimen measures 32 inches, but not entire. The general colour may be described as brown, slightly paler on the head. As described by Günther, a yellow black-edged streak runs from the rostral along the canthus rostralis and superciliary shield on to the neck, where it becomes broader and is prolonged along the side to the end of the tail, increasing in width on the middle of the body. Another yellow black-edged line runs backwards from the rostral, along the suture of the frontals, to the anterior extremity of the vertical, where it divides, one branch running along each side of that shield to near its end, where it makes a slight outward bend, and then runs backwards through the centre of each occipital, as a yellow band on each side of the vertebral line as far back as the root of the tail. Another narrow yellow black-edged line runs from the rostral, below the loreal region, to the eye and above the angle of the mouth, and is prolonged along the side to the end of the tail, covering the angle of the ventral and one half of the first row of scales; the black line defining it below can be indistinctly traced even as far forwards as the lower labials. All these longitudinal yellow lines are strongly margined with black on each of the sides, and they are equally prominent with the brown bands of the ground-colour.

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* Journ. As. Soc. Beng. vol. xxxix. 1870, p. 207.

I have received three specimens from Simla on the Himalaya; and a specimen in this museum is from Lower Bengal.

DENDROPHIS PICTA, Gmelin; Gthr. *l. c.* p. 297.

Darjeeling and Garo Hills.

PSAMMODYNASTES PULVERULENTUS, Boie; Gthr. *l. c.* p. 292.

The general appearance of this Snake is strongly viperine, so much so that, in roughly separating a large collection of Snakes from Darjeeling, I found when I came to examine the species critically that I had unwittingly placed the largest specimen of seven along with a fine series of *T. monticola.*

It is the subject of considerable variation in the head-plates, as is evinced by the following table:—

Dark ♀.

Total length.		Tail.		Postoculars.		Loreals.		Ventrals.	Caudals.
				R.	L.	R.	L.		
20″	3‴	3″	3‴	3	2	1	2	175	55
22	2	3	6	3	3	1	2	171	60
18	6	3	0	2	2	1	1	175	58
19	6	3	0	2	2	1	1	175	53
8	9	1	6	2	2	1	2	171	54
				Light ♂.					
19	0	3	10	3	2	1	1	166	65
17	10	3	7	2	2	1	1	169	62

The posterior frontals are bent down on the side of the head; and when a second loreal exists it is due to the separation as a distinct shield of that portion of the posterior frontal. The three postoculars result from a portion of the fifth labial being separated as such. There are sometimes only seven upper labials, due to union of the third and fourth, the true character of the compound shield being sometimes shown by a trace of an imperfect suture*.

There are two well-marked types of coloration, one being almost wholly black and the other light reddish brown. All the black specimens I have examined are females, and the light-coloured ones are males. In the black specimens there is a series of orange zigzag spots along the angles of the ventrals and first scales on the anterior half of the body, and the basal margins of the second row of scales are pure white, which, however, is only visible when the scales are drawn apart. The same markings are also seen in the light-coloured specimens when the scales are pulled asunder. Some of the latter specimens are marked by longitudinal lines on the sides. A dusky line finely mottled with white and black runs along the angles of the ventrals, with a narrow pale reddish line above it corresponding to the position of the zigzag orange spots, with a dusky brown and broader band above it spotted with black and white.

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* I have a specimen of this Snake from the Khasi Hills with the anterior and posterior frontals confluent, but in every other respect normal. It is a pale-coloured specimen (male?).

This species appears to be restricted to the tropical valleys about Darjeeling; for all my specimens are from elevations of from 1700 to 1900 feet. It does not appear to be uncommon.

DENDROPHIS PICTA, Gmel. (Gthr. *l. c.* p. 297), var. ANDAMANENSIS.

Scales in fifteen series, smooth, with apical grooves; vertebral scales much enlarged, hexagonal. Ventrals keeled, 196; subcaudals 130. Head elongated; snout rounded in front. Rostral broader than high, with a deep impression in front, just reaching to the upper surface of the head. Præfrontals slightly longer than broad, rounded in front, and more than half as large as the postfrontals, which are broader than long and bent down on the sides of the head, forming a broad suture with the loreal. Vertical broad in front, narrow in its posterior half. Superciliaries large and almost as broad as the vertical. Occipitals of moderate size, rounded behind. Nostril large, between two rather prominent nasals, the posterior shield forming a suture with the anterior shield, posterior frontals, loreal, and first and second labials. Loreal narrow and much elongated, lying on three upper labials. One large præocular reaching the upper surface of the head, but not touching the vertical; two postoculars, the inferior one the smallest. Temporals 2+2+2. Upper labials nine, the fifth and sixth forming the floor of the orbit. Two pairs of elongated chin shields, the posterior the longest; the first in contact with five labials.

Grass-green above, each scale with a broad black margin, and the ventrals with a black margin externally as far as the keel. The black margins of the lateral scales so broad that when the body is at rest they produce the appearance as if a black line ran along the side of the body. A black band the breadth of the loreal, through the eye, over the inferior postorbital and upper margins of the last upper labials, to the side of the neck, where it breaks up at intervals of two rows of scales into round black spots, of which there are five along each side of the neck, behind which they enlarge into oblique black V-shaped markings on the anterior tenth of the body. A faint dark line underneath the keel. Length of body 2′ 8″ 6‴; tail 1′ 2″.

Andamans.

TRAGOPS PRASINUS, Reinw.; Gthr. *l. c.* p. 303.

In the largest specimen the fourth upper labial does not enter the margin of the lip, and the seventh and eighth are nearly completely united. On the left side there are nine labials, but the fourth is divided longitudinally; and an arrangement similar to this occurs on both sides of the other specimen.

No.	Length.	Tail.	Ventrals.	Caudals.
1	$62\frac{2}{8}''$	$22''$	203	170
2	$48\frac{7}{8}$	$17\frac{3}{8}$	203	167

Darjeeling, 3200 feet.

The most common Tree-Snake in Bengal is *Passerita mycterizans*, which is very prevalent in the neighbourhood of Calcutta.

DIPSAS HEXAGONATA, Blyth, Journ. As. Soc. Bengal, xxiv. p. 360.

Dipsas multifasciata, Blyth, Journ. As. Soc. xxix. 1861, p. 114; Stol. J. As. Soc. xxxix. 1870, p. 119.

Scales smooth, in twenty-one rows; a single apical groove. Vertebral series enlarged, hexagonal, elongated on the anterior part of body, short and broad behind. Ventrals 232–248; caudals 108–125.

One, sometimes two, præocular, reaching to the upper surface of the head; vertical nearly as broad as long, margin straight or slightly convergent. Loreal of moderate size, quadrangular, rather higher than long or square; two postoculars; eight upper labials, the third, fourth, and fifth entering the orbit. Temporals irregular, varying from 1+2, 2+2, 2+3, to 3+3, with one, two, or three temporals in contact with the oculars. Eleven teeth in each upper jaw, increasing in length from before backwards, the last grooved. Uniform dark reddish brown or dark olive reddish brown above; a faint dark line behind the eye in some, absent in others. The surface of the head is faintly and minutely speckled with brown; under surface coral-red or pale pinkish-yellow anteriorly, deepening from before backwards. Young specimens show an irregular line of white spots margined below with black on the angle of the ventrals; the body with a series of five black transverse zigzag lines. General colour above bright brick-red; below white anteriorly, darkening to red posteriorly.

Hab. Darjeeling, 2300 feet; Bengal; Andamans.

Blyth's type of *D. hexagonata* is no longer in the Museum; but some young specimens from the Andamans referred to this species agree with my specimens in all essential particulars, even to the variation of the temporals. Some of them, however, have a small defined black spot in the centre of the vertical and on each occipital, which do not occur in any of the specimens before me; all the other markings are the same. The temporals are 3+3 and 2+3, two or three in contact with oculars. This species is separated from *D. bubalina* by its coloration, which is uniformly bright pinkish red or reddish brown, paler beneath.

No.	Length.	Tail.	Ventrals.	Caudals.
1	$44\frac{2}{8}''$	$9\frac{1}{8}''$	246	112
2	$40\frac{4}{8}$	$8\frac{6}{8}$	241	108
3	$40\frac{1}{8}$	9	242	125
4	$37\frac{6}{8}$	8	241	115
5	$33\frac{2}{8}$	$6\frac{7}{8}$	248	110
6	$30\frac{6}{8}$	7	240	123
7	$19\frac{3}{8}$	4	232	115
8	$16\frac{5}{8}$	$3\frac{4}{8}$	241	120
9	16	$3\frac{4}{8}$	243	122

Temporals and their relation to the oculars :—

	Number of temporals in 1st row.		in 2nd row.		Temp. in contact with oculars.	
No.	R.	L.	R.	L.	R.	L.
1	2	2	2	3	1	1
2	2		2		2	
3	2	2	2	2	1	1
4	1	1	2	2	1	1
5	2	3	3	3	2	2
6	2	2	3	3	2	2
7	2	2	3	3	2	2
8	2	2	3	3	2	1
9	3	3	3	3	2	2

If it were not for the great difference in the coloration of this species and that of *D. bubalina*, the two might very properly be regarded as one. However, there can be no doubt that Blyth's *D. nigromarginata*, which is a green Snake, is *D. bubalina*, although the lower and upper temporals on the left side are in contact with the oculars. These appear to be the only differences by which they are distinguished ; but a consideration of the amount of variation in these respects that characterizes the present species shows how little importance is to be attached to such characters in variable forms.

Since writing the foregoing, I have received fifteen specimens of this Snake from Darjeeling, obtained at an elevation of 5000 feet, agreeing in every respect with those described above. The largest is 45 inches in length, of which the tail measures 9″ 3‴. These fifteen specimens show the same variations as the foregoing ones.

Received along with these there is another Snake agreeing with Blyth's *D. multifasciata* and with the present species in all its structural characters, and to be distinguished only by its coloration. It is rich reddish brown above ; but there are about seventy-one zigzag transverse black bands on the sides, from the outside of the ventral scales three-fifths down the side at regular intervals. There is a series of not very well-defined black spots on the sides of the ventrals, corresponding more or less to the transverse bands ; and the sides of the ventrals generally are marbled with black, and their centres faintly clouded with minute dark specks. The surface of the head is minutely marbled in the same way as in this species; and there is the black line behind the eye.

I am strongly inclined to regard this as simply a rare variety of *D. hexagonata*; for, as I have already observed, the number of the scales on the body, the character of the head-shields, the number of the ventrals and caudals, correspond with this species.

In other specimens of this Snake, when the scales are pulled aside, they are found to have the margins slightly edged with black; and I believe that *D. multifasciata* is only an intensified variety of this character.

The coloration of this species removes it from *D. bubalina* and *D. trigonata*.

It appears to be a very common species on the hill-sides about Darjeeling, at elevations of 3500 to 4000 feet. It occurs also in Bengal, whence Blyth obtained his type, and extends also to the Andamans.

DIPSAS FORSTENI, D. & B.; Gthr. *l. c.* p. 309.

I have received three specimens of this species from Gwindpur, Maunbhoom, and Doomercoonda, in Bengal; and a variety of this Snake was procured by me in Ceylon, in a densely wooded part of the island, about twenty miles to the east of Galle.

The Bengal specimens agree in every particular with Günther's description, even to the splitting of the third labial. Ventrals 259; subcaudals 112. The largest specimen is much decayed in the posterior half of the body, so that I cannot count the ventral or subcaudal shields. It measures in total length 45 inches 6 lines.

The Ceylon specimen, which measures 35 inches in length, of which the tail is 6 inches 6 lines, is distinguished from the continental specimens by the brighter colouring of the head, especially in the greater intensity of the occipital and postocular bands, the former of which has a marked yellow margin, and the latter a line of the same colour from above the eye along its upper edge. All the labials, too, have black margins. The ventrals, besides the lateral spots, have their margins spotted with brown, and are finely punctulated with the same colour on the posterior six-eighths of the trunk. The subcaudals are finely margined with brown. With the exception of these differences, it agrees in every other particular with true *D. forsteni*. It has 270 ventrals and 107 subcaudals. It may be indicated as *D. forsteni*, D. & B., var. *ceylonensis*.

LYCODON STRIATUS, Shaw; Gthr. *l. c.* p. 318.

I have two specimens of this Snake—one from Agra, the other from Lahore. The occipitals in both specimens are the length of the vertical, and one-half that of the postfrontals. With that exception, and that the Lahore specimen has 190 ventrals, they present no other variations in the shields or scales.

Lahore :—Body $13\frac{1}{8}$, tail $2\frac{3}{8}$ inches; ventrals 190, caudals 49.
Agra :—Body $10\frac{4}{8}$, tail $2\frac{4}{8}$ inches; ventrals 171, caudals 59.

Both have a white collar; and in both the white spots are more or less bifid on the sides: in the Agra specimen they are resolved into a white vertebral line on the posterior half of the body.

The white of the upper parts in life is bright yellow, fading rapidly to white in spirit; and the collar is bright canary-yellow, brighter than the rest of the colouring.

This species is another instance of how the Central and South Indian fauna stretches upwards to the north-west, even so far as Lahore.

LEPTORHYTAON JARA, Shaw; Gthr. *l. c.* p. 321.

Hab. Garo Hills.

PAREAS MONTICOLA, Cantor; Gthr. *l. c.* p. 327.

Total length $22\frac{2}{8}$, tail $3\frac{7}{8}$ inches; ventrals 192, caudals 70.

This specimen differs from Günther's description in no lower labials entering the orbit, from which they are excluded by the lower anterior and posterior oculars. The latter is a very long curved linear shield, forming the under margin of the orbit. The upper extremity of the fourth labial comes in between the two shields, but is excluded from the orbit by them.

I have noticed a similar character in a specimen from Cherra Poongi, which had also the anterior pair of chin-shields almost confluent.

Darjeeling, 2250 feet.

Blyth's "*Dipsas monticola*, Cantor," J. A. S. vol. xxiii. p. 294, alluded to by Günther in his 'Reptiles of India,' p. 327, is *Cyclophis frænatus*, Gthr., from Assam. The only observable difference between the specimen in this Museum and that described by Günther is, that the anterior frontals are more than half the size of the posterior. It agrees, however, with the description in every other particular except that the ventrals are 158 instead of 165, and the caudals 106 instead of 95.

The only other specimens of this species are from Afghanistan, Mesopotamia, and Khasi Hills.

ERYX JOHNII, Russell; Gthr. *l. c.* p. 334.

This is a very common species in the North-west Provinces, and indeed over the dry country of North-western India.

Hab. Agra.

OPHIOPHAGUS ELAPS, Schleg.; Gthr. *l. c.* p. 341.

Length of specimen 8 ft. 2 in.; ventrals 243, caudals 85.

This Snake does not appear to be uncommon in Sikkim and Assam, and is of not unfrequent occurrence in Burmah. The largest specimen that has come under my observation is one, in length 11 ft. $9\frac{6}{8}$ in., from Debrooghur, Assam; but it is a stretched skin. This specimen in life was 10 feet long. After having been pierced with a spear, and the spear had been removed, it became as lively as ever, and kept up a running fight for 30 or 40 yards. In

Assam these Snakes occur on the grass slopes at the foot of the hills, and are called by the Assamese "Dabi Serp," and by the Cucharees "Garanga Sim." They are said to be very irascible during the breeding-season, and to charge without any provocation.

This Snake is not uncommon in Eastern Bengal; and I have obtained it close to Calcutta—one from the Royal Botanic Gardens, and another from the neighbourhood of Mutlah. I have heard of its occurrence at Raneegunge, and have seen a specimen from the Jessore. It is in all probability the "Black Cobra" of Hooker; and there can be little doubt that the Cobras constantly killed in the Sikkim Himalaya of fabulous dimensions are of this species. I have it from Darjeeling, at an altitude of 6000 feet.

BUNGARUS CÆRULEUS, Schneid.; Gthr. *l. c.* p. 343.

This specimen is uniform black above, pale brown beneath, and highly iridescent.

Length 23$\frac{7}{8}$, tail 3$\frac{5}{8}$ inches; ventrals 225, caudals 55.

Hab. Nazeerah, Assam, and from Agra.

This is the most generally prevalent poisonous Snake in the north-west provinces of India. It is rare in the neighbourhood of Calcutta and Lower Bengal, where the natives do not know it as a poisonous Snake. In its young state it has a considerable resemblance to *Lycodon aulicus* in the general character of its colouring; and I have received specimens of the latter Snake sent to me as examples of this species.

CALLOPHIS MACCLELLANDII, Reinh.; Gthr. *l. c.* p. 350.

This specimen belongs to Günther's variety γ, forming twenty-two rings, each dilating on the ventral surface into a large black spot, and each of these being separated by another isolated black spot.

No vertebral line.

Length 16$\frac{3}{8}$, tail 1$\frac{4}{8}$ inches; ventrals 219, caudals 33.

Hab. Nazeerah, Assam.

PLATURUS FISCHERI, Jan; Gthr. *l. c.* p. 356.

The specimen which I provisionally refer to this species has nineteen rows of smooth scales round the fore part of the trunk, in longitudinal series, and 235 ventrals; there is no azygos shield between the posterior frontals; and in all of these characters it agrees with this species. But on comparing the head with Günther's drawing, I find that the anterior frontals in my specimen differ from it in being long and pointed anteriorly, and considerably larger than the posterior pair, and in the vertical being proportionally larger than in *P. fischeri*, and the occipitals longer and more pointed. It has one præ- and two postoculars; and the third and fourth labials are below the eye. Two pairs of large chin-shields, the posterior pair with a large scale between their posterior extremities. It also differs from *P. fischeri* in having fifty-six black rings round the trunk instead of thirty-six; but I do not attach much importance to this, as *P. scutatus* shows about an equal variation: yet, at the same time, Günther stating that his eight specimens show the same assemblage of characters as laid down in his description, the occurrence of fifty-six rings in my specimen suggests that this multiplicity is either due to greater age (for it measures 49 inches in length) or to variation. The head, too, is wholly black, with the exception of a yellow band from the posterior margin of one eye to the other. The upper surface is olive-green, and the sides and belly rich dark gamboge-yellow, and the fifty-six rings are intensely black, and the scales generally have a very bright shining lustre.

Fallahs Mullah, a tidal stream, Calcutta.

If this form should prove to be new, I would indicate it as *P. affinis*, n. sp.

HYDROPHIS GRANOSA, n. sp.

Hydrophis gracilis, Shaw; Theobald (in part.), Cat. Rept. As. Soc. Mus. 1868, p. 68.

Anterior part of the body moderately slender; head rather tapering and laterally compressed. Two labials below the eye; third labial widely separated from the nasal by the second labial, frontal, and præocular; one large anterior temporal, with two smaller ones behind it; one præocular and one postocular; one pair of round scales like chin-shields not in contact with each other or with any of the labials. Forty-three rows of scales round the neck. Scales small, with a prominent keel slightly dilated at either extremity; the scales are elongately leaf-shaped and markedly imbricate on the slender portion of the body, but on the thick portion behind they are truncated at their tips and less imbricate; the scales immediately behind the head, and the shields of the head generally, and the scales on the lower jaw, are covered with minute rounded granular tubercles, which are especially numerous on the rostral. The ventrals are twice the size of the neighbouring scales, and are of a uniform size throughout, and those of the thick part of the body are not split; each carries from two to four small tubercles, usually arranged in pairs, two large ones anteriorly, and two smaller ones posteriorly, and external to the latter. Six anal shields, the outer one very large, and equal to two of the others in size. Ventrals 105. Terminal scale of the tail small. Fifty-two non-confluent black bands on the body, extending down the sides, but not reaching the ventral surface; eight black bars on the tail. The ground-colour in this spirit-specimen is pale yellowish. It was obtained at the Sand Heads.

The number and character of the scales of this Snake and the scale-like nature of its chin-shields seem to indicate that it is closely allied to *H. stokesii*, a species which I have never seen. By some of its characters it is also allied to *H. cærulescens*, Shaw.

HYDROPHIS JERDONII, Gray; Gthr. *l. c.* p. 362.

Total length $38\frac{7}{8}$ inches, tail $3\frac{1}{2}$. In this specimen there are forty black cross bands passing right round the body; but, besides these, there are occasionally aborted bands, the remnants of which are found either as large black dorsal spots or imperfect bands on the belly half. There is a black spot on the back of the neck between the first band that passes across from the angles of the mouth and the one behind it. In every other particular this specimen differs in no way from typical *H. jerdonii.*

Pooree.

This specimen is much infected with Cirripedes and Tubularious Zoophytes, which seem to indicate that it is not of very active habits.

HYDROPHIS CYANOCINCTA, Daud.; Gthr. *l. c.* p. 367.

Length (total) $50\frac{3}{8}$ inches, tail $4\frac{2}{8}$.

Pooree.

HYDROPHIS CHLORIS, Daud.; Gthr. *l. c.* p. 370.

This specimen has the third labial not in contact with nasal on one side; but on the other, throughout, the third labial is broadly in contact with the nasals, as a small labial has been formed between the first and second, thus converting the latter into a third labial. If this arrangement had occurred on both sides, it might, perhaps, have given rise to another synonym for this species.

Hydrophids are frequently cast ashore on the Pooree coast; but they soon die, even when every care is taken of them.

HYDROPHIS LINDSAYI, Gray; Gthr. *l. c.* p. 371, var. A.

Aturia lindsayi, Gray, Zool. Misc. p. 6.

Hydrophis lindsayi, Gray, Viper. Snakes, p. 50.

H. "*gracilis,*" Shaw; Günth. Ind. Rept. p. 371 Theobald (in part.), Cat. Rept. As. Soc. Mus. p. 68.

Head very small, not distinct from the neck, which is very long and whip-like; the slender portion of the body equals more than one-third of the total length. The rostral pentagonal, as broad as high, the lower margin with a median process and a concavity on either side of it; nasals oblong, with the nostrils in their posterior half, in the angle formed by the posterior and external margins; frontals longer than broad; vertical shield-shaped, very slightly smaller than a superciliary; occipitals much elongate, rounded posteriorly. One præocular and one postocular; two large temporal shields alongside of the occipital. Third labial not in contact with the nasal; second labial very large; first lower labials forming a broad suture behind the mental, and succeeded by a pair of pentagonal chin-shields forming a broad suture and succeeded by a triangular pair widely divergent behind. Scales imbricate, in twenty-eight series round the neck, each with a prominent tubercle near the tip. Ventral shields on the slender portion of the body twice as large as the surrounding scales, smooth anteriorly, but with two tubercles when they reach the thick part of the body, where they are not much larger than the neighbouring scales; few of them are longitudinally divided. Ventrals 417. Anals four, the outer pair very large. Sixty-one black bands on the body; those on the neck confluent with the black under surface of that part of the body; those on the back extending only on to the side. Head black; tail with seven black bars.

General colour (in spirit) above pale olive-grey; dirty yellow on the sides and under surface, except the slender part of the body.

Length 38″ 6‴, tail 2″ 7‴.

With the exception of the absence of light keeling on the dorsal scales, this specimen agrees in every particular with this species.

HYDROPHIS CORONATA, Gthr. *l. c.* p. 372.

This specimen is 42″ 3‴ in length, tail 3″ 9‴. Twenty-one rows of scales round the neck; imbricate, those on the back keeled, and those of the side with a small tubercle. Ventral shields about twice as large as the surrounding ones, with two minute tubercles on each; the rostral is much broader than long; and the third labial is not in contact with the nasal. One præocular and postocular; three large tubercles along the side of each occipital; two pairs of chin-shields in contact with each other. There are fifty-eight complete blackish rings round the trunk, and eight black bars on the tail. In this specimen there are six anal shields, the two outermost ones being the largest; but in a specimen measuring 17″ 8‴, tail 1″ 10‴, there are only four anal shields, the external ones being much larger than the others. It has, however, only forty-seven complete black rings on the trunk, and nine black bars on the tail. The coloration of the head and of the ventral surface of the long whip-like anterior portion of the body is the same as described by Günther.

Both of these specimens are from a tidal stream in the vicinity of Calcutta.

HYDROPHIS CANTORIS, Gthr. *l. c.* p. 374.

Hydrus gracilis, Cantor, Mal. Rept. p. 130 (not synon.).

? *Liopola fasciata*, Gray, Zool. Misc. p. 60 (young) (not Schneid. nor Shaw).

Hydrophis gracilis, Shaw; Theob. Cat. Rept. As. Soc. Mus. 1868, p. 68.

The specimen in this museum catalogued by Theobald as *H. gracilis*, Shaw, is undoubtedly of this species. The upper jaw hardly projects beyond the lower one; and the rostral is prolonged backwards, and is not cutting in front. The third labial is in contact with the nasal; and there are two large temporals alongside of the occipital, one præ- and one postocular, and two pairs of chin-shields, in contact with each other. There are twenty-three rows of scales round the neck, which is very slender and nearly one-half of the length of the body. In the narrow part of the body the ventrals are twice the size of the neighbouring scales; and in the thick portion they are split into two, and carry two, three, or four tubercles. The tubercles on the scales of the slender portion are very indistinct, but in the thick part they become distinct, and are usually two in number. Ventrals 456; six small anal shields. Total length 51″ 6‴; tail 4″ 3‴. Twenty-eight blackish rings round the slender portion of the body, confluent on the back, and connected on the under surface by the black ventral shields. Compressed part of the body uniform yellowish (spirit specimen); but the general colour is much faded; the black rings, however, on the anterior half are well marked.

This fine specimen was obtained at the Sand Heads at the mouth of the Hughli.

ENHYDRINA SCHISTOSA, Daud.*

Distinguished from its very near kinsfellow, *E. valakadyen*, by its narrow and more elongated head and head-shields, its longer gape, the smaller and more pointed character of its scales, which are also not nearly so strongly carinated as in that species, their greater number, and its relatively shorter and narrower tail.

Body elongate, compressed; head narrow and elongate, one-third the length of the tail; nasals large and elongate; fourth labial below the eye; one postocular united to the fourth labial; mental shield very narrow and much elongated, as long as the first labials; fifty to sixty longitudinal rows of scales round the neck. The scales are rather small, elongate, pointed, and leaf-shaped on the anterior third of the body, broader and more round at their points in the middle third, and still more circular on the last third; scales on the throat, neck, and a considerable portion of under surface of the anterior part of the body narrow, much pointed and elongated, and perfectly smooth, without any trace of tubercles. The shields of the head are quite smooth; but the scales of the back are keeled and slightly imbricate, while those on the sides are feebly keeled, hexagonal, and scarcely imbricate. The tail is about one-tenth the length of the body, and is not so deep as the preanal portion of the body. Uniform dark olive-green on the dorsal surface, paling to pale greenish yellow on the sides, and to white lower down on the sides and on the belly.

Length, total 40″ 1‴, tail 4″.

Hab. Gopalpore.

From the strong resemblance of this species to *E. valakadyen*, it is probable that the two have long been confounded. To Dr. Stoliczka belongs the credit of having again called attention to the characters distinguishing these two forms, which appear to be quite distinct. I have before me for comparison a specimen of undoubted *E. valakadyen*, of smaller size than this specimen; but, notwithstanding, the scales of the former are much larger every way, and broader and truncated at the tips, than in the latter; so that age will not account for such differences. Moreover the form and size of the head of *E. schistosa*, compared with *E. valakadyen*, are so pronounced that they at once strike one as characteristic features of the Snake; these, combined with the characters given in the above diagnosis, are sufficient to separate them.

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* See Journ. As. Soc. 1870, p. 213.

I have two specimens of *Enhydrina* from the Botanical Gardens,—one with the elongate head and rather long gape of *E. schistosa*, with the upper surface of the head granular, with forty-seven rows of scales 2 inches behind the neck, the head being one-third the length of the tail; the other specimen has the short granular head of *E. valakadyen*, with forty-nine rows of scales round the neck 2 inches behind the head.

TRIMERESURUS ERYTHRURUS, Cantor; Gthr. *l. c.* p. 386.

Sulsaugur, Assam.

TRIMERESURUS CARINATUS, Gray; Gthr. *l. c.* p. 386.

Garo Hills.

TRIMERESURUS GRAMINEUS, Shaw; Gthr. *l. c.* p. 385.

Scales in twenty-one series, those on the head smooth or faintly keeled; an azygos shield between the supranasals. Bright yellow-green, darkest on the back, and greenish yellow on the head; under surface bright greenish yellow, with a faint greenish-yellow line along the outer line of scales, and continued on to the head below the eye; tip of tail brick-brown.

Length.	Tail.	Ventrals.	Caudals.
23″ 3‴	3″ 3‴	169	60 (♀)
30 6	5 6	167	58 (♀)
30 9	5 9	173	65
19 3	3 6	171	68

In the last two specimens the lines along the side are very bright, the lower one bright brick-colour, involving one-half of the first body-scale, the other pure white, covering the other half, and the half of the second body-scale, becoming narrow on the tail, and disappearing about its middle, or, as in the case of the young one, becoming broken up into a series of red and white lateral spots; upper surface of the tail brick-red.

This appears to be a common Snake in the tropical valleys below Darjeeling, where it is usually found at an elevation of 2000 feet.

TRIMERESURUS MONTICOLA, Gthr. *l. c.* p. 388.

Parias maculata, Gray, Ann. & Mag. Nat. Hist. 1853, xii. p. 392.

Trimeresurus andersoni, Theob. Cat. Rept. As. Soc. Museum, 1868, p. 75.

Theobald's *T. andersoni* was founded on a solitary specimen from an unknown locality, with twenty-five rows of keeled scales and an azygos shield between the supranasals. In specimens, however, of this species from Hotha (4500 feet), Western Yunan, the azygos is sometimes present, and absent in others, and the scales are in twenty-three rows. Two specimens before me have twenty-four rows of keeled scales, two others have twenty-five, and three others have twenty-three. One of the specimens with twenty-three is from Darjeeling; and the two others are from Cheera Punji, Khasi Hills.

In the specimens from the latter locality one has a pair of small shields between the supranasals, and another has three small shields intervening between them. Another specimen from Darjeeling, with twenty-five rows of scales, and measuring 28 inches 6 lines, tail 3 inches 2 lines, has a pair of shields between the supranasals, and three small shields in front of the former, evidently resulting from division of the supranasals themselves, and of the azygos also. It is a female, with ventrals 146, caudals 35. The coloration is in every way the same as described by Günther. I observe in Günther's figure of this Snake that a small azygos shield is impacted between the supranasals and rostral; and if this shield were a little enlarged, and were completely to separate the supranasals, his figure would agree in every respect with my seven specimens from Darjeeling, all of which have an azygos shield between the supranasals, and from twenty-three to twenty-five rows of keeled scales. The occurrence of twenty-four rows in two of the specimens leads to the apparent limit of variation, twenty-five. It is easy to understand how the azygos may become broken up. The coloration of all these specimens (twelve), including *T. andersoni*, is identical in every respect; and, as Günther observes, the males are blackish ash, and the females and young pale brown. The aged females, however, become dark brown. The Y-marking on the neck is present in all. The adults measure 4″ 9‴ in circumference. The smallest specimen measures 6″ 9‴, of which the tail is 1″; and the largest 32″ 3‴, tail 4″ 10‴. The ventrals vary from 140 to 148, caudals from 36 to 48.

Hab. Darjeeling; Cheera Punji, Khasi Hills; Hotha, Yunan, N. China, 3520 to 5000 feet.

With these facts before us, the scales may be said to vary from twenty-three to twenty-five rows; and the supranasals may be regarded as varying from a minute shield impacted in front of them, to a perfect shield, wholly separating them, or breaking up in some cases into two or five supranasal shields. These differences may be regarded as indicating special varieties; but it is very questionable whether they are invariably communicated from the parent to its offspring. I am inclined to think they are not, for I have on more than one occasion, when examining young Snakes that I have removed with my own hands from the mother, found them exhibiting variations in their head-shields; and the occurrence at Darjeeling of specimens of this Snake with twenty-three rows of scales, while the majority have twenty-five rows, is conclusive proof that this character is not one characteristic of a local form. It is curious to remark that all the specimens that have hitherto yielded twenty-three rows of scales have not been adults, and that all my largest specimens yield the greatest number of scales round the neck; and in the light of such a consideration it seems possible that mature forms from Cheera Punji will yield twenty-five rows of scales.

TRIMERESURUS CONVICTUS, Stol. Journ. As. Soc. Bengal, xxxix. p. 224.

This species is very closely allied to *T. monticola*; but, as Dr. Stoliczka observes, the scales are slightly broader and more rhombic. I presume he refers to the adults of that species; but the specimen to which the name *T. convictus* has been given is evidently not a full-grown individual; for it only measures 11″ 3‴ (the body), and 1″ 8‴ (the tail). Now in the young of *T. monticola* I observe that the scales are generally broader than in the adults, and the keeling is very indistinct. Moreover the head does not appear to me to be higher than in *T. monticola*; but, as Dr. Stoliczka remarks, it is slightly more elliptical than in *T. monticola*: perhaps, however, this appearance may be heightened from the circumstance that it is nearly severed from the body. There is an azygos shield more in front than betweent he supranasals; and the scales of the head are larger than in that species. The tail is certainly shorter than in *T. monticola*, and the number of scales fewer.

The single specimen of this species was obtained at an elevation of 2400 feet, on the Western Hill, Penang.

HALYS HIMALAYANUS, Gthr. *l. c.* p. 393.

One specimen before me has only twenty-one rows of strongly keeled scales round the middle, only 154 ventrals, and 45 caudals.

Dr. Stoliczka informs me that this species is far from uncommon to the north-east of Simla.

ECHIS CARINATA, Schneid.; Gthr. *l. c.* p. 397.

This Viper is common in the country about Agra and Delhi, and extends as far east as Singhbhoom, in Bengal, and to the south as far as Madras. One specimen before me has the superciliary region scaly and 166 ventrals, while another, from Singhbhoom, has also a scaly superciliary but only 138 ventrals. This large number of ventral shields induces me to regard the African and Asiatic snakes as one.

This Viper makes a curious, prolonged, almost hissing sound by rubbing the sides of the folds of its body against each other. The head remains almost fixed in one position, and the body is made to move in folds in such a way that the sides are rubbed against each other in the direction of the scales. When we come to examine the latter structures it is at once apparent how the sound is produced. We discover that the first row of scales above the ventrals are perfectly smooth, that the next one or two rows above these are strongly keeled, and that in the three or five following rows the keel is very strongly developed and toothed like a saw. These eight lateral rows of scales are placed obliquely on the body, with their tips directed downwards and backwards, while the other scales are placed longitudinally. By this arrangement the serrated keels of the scales are made to pass over each other obliquely instead of in a straight line, which would have been productive of little or no noise, whilst the oblique rasping of these little saws against each other produces a noise that can be heard as well as the hiss of any large serpent. The noise can be produced after death by rubbing the sides of the body against each other in the direction of the scales. During life this handsome little Viper is always engaged in rubbing its scales together when disturbed. It is very fierce, and strikes with great vigour.

It is very deadly and is the cause of much mortality among the field-labourers of the north-west of India, where it appears to be not uncommon.

RANA KUHLII, Schleg.; Gthr. *l. c.* p. 404.

One specimen of this Frog exists in the Museum. Unfortunately no locality is given; but it is probably either from Ceylon or Burmah, in all likelihood from the former locality. It has not, however, the transverse plaits of the skin of the back characteristic of Günther's var. B from Ceylon, but is almost smooth above—a circumstance that may be accounted for by age, as the body measures 2″ 7‴. The lower part of the leg and tarsus are roughly tubercular. It agrees in every other character with Günther's description of the species; and if the absence of the transverse folds and small tubercles is not attributable to age, it verifies Günther's statement that the transverse folds of the skin are not a constant character, any more than the mandibulary fangs, which are well developed in this specimen.

RANA TIGRINA, Daud.; Gthr. *l. c.* p. 407.

Agra.

RANA FUSCA, Blyth, Journ. As. Soc. Bengal, xxxiv. pp. 719, 720; Günther, *l. c.* p. 403; Theobald, Cat. Rept. As. Soc. Museum, p. 79; Günther, P. Z. S. 1868, p. 478.

Head triangular, rather broad behind; snout rather short, pointed, and rounded in front, truncated in the aged adult; no canthus rostralis; sides of snout broadly rounded, and shelving outwards. Nostrils oval, much nearer the extremity of the snout than the eye. Width between the eyelids slightly greater than the distance between the eye and the nostril. Tympanum indistinct in the young, much smaller than the eye, almost hidden in the adult, reduced to a small yellowish disk in the centre of the wide aural, depressed. Vomerine teeth six to nine, strong, on two prominent rather short oblique ridges, on a line with the inner anterior angle of the cohanæ, converging behind, but widely separated. In adult specimens a strong transverse osseous ridge behind the choanæ. Tongue cordate. Two very large fang-like apophyses on the lower jaw, directed backwards, and received into a groove in the upper jaw. Rostral portion of snout prominent, overlapping and trenchant. Lower jaw transversely truncated in adults to receive it. No vocal sacs. A strong fold from the eye over the tympanum to the shoulder; posterior third of upper eyelid tubercular. Skin smooth above in adults, slightly tubercular in other and younger individuals, especially on the sacrum; sides tubercular in adults. Limbs rather short and stout. The first finger is slightly shorter than the fourth, and the second is shorter than either; the third is about one-third longer than the fourth. From the vent to the metatarsal tubercle is longer than the body. A fold along the metatarsus, and a fringe along the fifth and first toes. A flattened oblong metatarsal tubercle. Foot broadly webbed, the membrane reaching to the extremities of all the toes; fingers and toes slightly dilated at their tips.

Uniform dark brown (spirit specimen) above in adult, with faint dark marbling on the back of the thighs, and a blackish line along the supratympanic fold; sides paler, under surface yellowish; lower lip with from two to three broad black bands. In younger specimens the marbling or reticulation on the thighs and the barring on the lips are well marked. In some specimens the upper surface is irregularly spotted with dark blackish brown; and the majority of specimens show broad dark bars of the same colour on the limbs, becoming indistinct with age. Blyth mentions a mesial white spot on the lower jaw, corresponding to the symphysis and to the interval between two of the blackish bars. Three out of six have a yellow vertebral line.

This species appears to be closely allied to *R. tigrina* in its vomerine ridges and in the general form of its body, but approaches *R. kuhlii* in its fang-like apophyses, almost hidden tympanum, and elongate metatarsal tubercle.

Blyth states that it is common in the Tenasserim valley, where it is eaten by the Burmese.

Length of body.	Length of hind leg.
6″ 4‴	8″ 11‴
5 5	8 5
4 11	8 9
4 6	6 11
3 8	5 11
3 0	5 1

Rana liebigii, Günther.

Megalophrys gigas, Blyth, Journ. As. Soc. Beng. xxii. p. 410, xiii. p. 299, and xxiv. p. 717.

Rana liebigii, Gth. P. Z. S. 1860, p. 157, pl. 28. fig. A.

Hylorana erythræa, Schlegel; Theobald, Cat. Rept. As. Soc. Museum, p. 84.

Blyth's name has the priority; but it is so inappropriate that I prefer to retain Günther's, for which this much can be said, that it will not give false notions regarding the size of a Frog which does not attain to one-fourth of the dimensions of *R. fusca* or *R. tigrina*.

Blyth's type is 4″ 6‴ in length, the hind leg 7″ 3‴, and the foot from the heel 3″ 4‴; the breadth of the head 2″. The largest specimen, referred by Theobald to *H. erythræa*, is Blyth's type of

M. gigas, as is proved by comparing it with Blyth's description. It agrees in every particular with Günther's description. Blyth observes that the young have the head proportionally less broad than in the adult, which is well illustrated by his specimens.

Hab. Sikkim Himalaya.

RANA CRASSA, Jerdon, Journ. As. Soc. Bengal, 1853, xxii. p. 531; Theobald, Cat. Rept. As. Soc. Museum, p. 79.

This species, as observed by Theobald, is closely allied to *R. tigrina*, from which it is distinguished by its more obtuse and shorter snout and conspicuously broader occiput. Its metatarsal tubercle is proportionally larger, stronger, and more crescentic than in *R. tigrina*, resembling the shovel-shaped tubercle of *Pyxicephalus*. Dr. Jerdon regards it as allied to *R. kuhlii*,—a comparison which would seem to indicate that he had never identified *R. kuhlii*; for *R. crassa* has the naked tympanum of *R. tigrina*, wants the fang-like apophyses of *R. kuhlii*, and has the strongly developed vomerine ridges of the former species.

Snout rather short, and not so pointed as in *R. tigrina*. Occiput broad, the breadth across the gape being longer than the head. Loreal region concave, shelving outwards. Nostrils oval, nearer the snout than halfway between the snout and the eye. Tympanum distinct, smaller than the eye. Eustachian tubes large, larger than the choanæ. Vomerines 12 to 15, on two oblique prominent ridges from the anterior inner angle of the choanæ, converging behind, but separated by a moderate interval. Tongue of moderate size, cordate. No fang-like apophyses on the lower jaw. Back with short longitudinal folds; a few tubercles on the sacral region. A fold from the eye over the tympanum to the shoulder; a fold between the eyelids, and a very rudimentary one along the inside of the tarsus, and a fringe along the fifth toe. Hind limbs stout, rather short, the distance between the vent and the metatarsal tubercle being the length of the body or a little less. Toes fully webbed, the membrane hardly reaching to the extremity of the fourth toe. A prominent crescentic sharp-edged tubercle at the base of the first toe. Fingers and toes with the same proportional length as in *R. tigrina*.

Brown above (spirit specimens), spotted with darker in the same way as in *R. tigrina*. Under surface yellowish, obscurely spotted on the chin and throat; a narrow brown longitudinal streak on the same region in youngish males. Lips barred with blackish; vocal sacs of males dusky externally. One out of four with a vertebral band.

	Body.	Hind limb, to metatarsal tubercle.
Length of large female......	5″ 2‴	5″ 1‴
,, ,, male	3 9	4 0
,, ,, female......	3 7	3 7

Dr. Jerdon describes the body as greenish above, with dusky markings, and states that the Frog was rare—found in a few tanks in the Carnatic. The specimens of this notice are from Ceylon.

RANA GRACILIS, Wiegm.; Gthr. *l. c.* p. 409.

This species appears to be widely distributed from Central India through Bengal, Assam, Arakan, Burmah, and Tenasserim, as far south as Penang. I have not seen any specimens from the Nicobars or Andamans, as the Frogs from these localities referred by Dr. Stoliczka to this species appear to be quite distinct. Dr. Stoliczka mentions that it does not hesitate to take to the sea or brackish water, and that it is a true littoral species, overlooking, however, the fact that it is widely distributed over Central India, Bengal, and Burmah, far removed from the sea. The probability is that he had the Andaman and Nicobar species in view when he made the foregoing generalization, and not true *R. gracilis.*

RANA CYANOPHLYCTIS, Schneid.

This species is very common in the Nagpur district, Central India, and it occurs also in Orissa and in the neighbourhood of Calcutta, but is less numerous in the Malayan peninsula, according to Günther.

PYXICEPHALUS BREVICEPS, Schneid.; Gthr. *l. c.* p. 411.

Pyxicephalus fodiens, Jerdon, As. Soc. Journ. xxii. p. 534.

This handsome species, of which I have received twenty-one specimens from Agra, where it appears to be common, has been found hitherto only in the Carnatic. In four the marbling of the back is confluent over the mesial line of the back as a vertebral black line, connected, however, with the reticulations. In others there is a tendency in the lateral reticulations to form a black lateral band from behind the eye. Out of twenty-one specimens, only nine show the white vertebral line. The black spots on the back are not, as a rule, so distinct as in Günther's figure, nor have they the white border; and in some they almost disappear, while in others they are converted into rings, enclosing a pale centre of the same colour as the general surface of the body. In the specimens with no trace of a vertebral line the spots are all but obsolete.

Dr. Jerdon's *P. fodiens* is simply *P. breviceps* without a pale vertebral line.

XENOPHRYS MONTICOLA, Gthr. *l. c.* p. 414.

Xenophrys gigas, Jerdon, Proc. As. Soc. Bengal, 1870, p. 85.

I have received seven specimens of this beautiful Frog from Darjeeling; and have removed another uninjured specimen from the stomach of an example of *Tropidonotus macrophthalmus.* The largest specimen measures 2″ 8‴ in length, the hind limb 4″ 1‴; the smallest is 1″ 5‴ long, and its hind limb 2″ 4‴. There are two varieties of coloration, the one a light and the other a dark brown. They agree in every particular with Günther's description; so that I shall merely indicate one or two points which appear to be characteristic of the species, and which Günther could not have been expected to notice in his young specimen, measuring 19 lines. The first peculiarity is that the back is covered over with very minute (microscopic) tubercles, that tend to arrange themselves in a linear manner. A series of these tubercles constitute the outline of the triangular brown spot on the crown, and also of the Y-shaped mark on the nape, and of other anastomosing lines on the back behind it. There is usually a line of them running along the side of the back. All of these lines have a beaded appearance, and are very fine, and not discernible in some specimens, nor in adults. The triangular black spot extending between the eyes has a very fine white margin, and sometimes encloses a light-coloured spot in its centre. In the light-coloured variety there are a number of dark-coloured spots with pale margins, arranged in a circle round a central one, with smaller spots about them. The Y-shaped mark has also an obscure white margin. The sides are generally black-spotted. In the dark variety, the chin, throat, and thorax are black, marbled with whitish; more so on the belly, the posterior third of which is immaculate yellow. The upper lip with four black bars on each side. A black band from the eye below the canthus rostralis to the snout; a black band over the eye through the tympanum; a very delicate yellowish line along the canthus rostralis, the margin of the eyelid, and along the supratympanal fold to the shoulder. A black band from the vent along the back of the thighs, with a white margin above and a white spot near its termination on the lower third of the thigh. Limbs barred with brown. Palms and soles black, with a bright yellow external margin. In the pale-coloured variety all these markings are the same, only less intensely marked.

I have a specimen of Dr. Jerdon's *X. gigas* beside me, but I find that it in no way differs from the Darjeeling large specimens, which are the adults of this species.

Hab. Sikkim Himalaya, 3500 feet.

I removed some land-shells from the stomach of this species large enough to form a good meal.

CACOPUS GLOBULOSUS, Gthr. *l. c.* p. 416.

I procured a specimen of this species in the Botanical Gardens, Calcutta, some years ago, but have never succeeded in obtaining another. It is an adult female, measuring 2″ 6‴, and the hind limb 2″ 8‴. This specimen, when brought to me, was distended in the same way as Günther's young specimen, but I was unable to learn any thing of its habits. The ovaria are very small (June).

Uniform brown above, yellow below.

Besides the fold between the eyes, and descending to the angle of the mouth, there is a short obscure fold from below the posterior angle of the eye to the shoulder. This fold is very obscure on one side, but well marked on the other, and it may be a variable character. There are a number of minute black tubercles on the sides of the thighs external to the vent.

The vomerine prominences appear to be more mucous folds than papillæ.

DIPLOPELMA BERDMOREI, Blyth, Journ. As. Soc. Beng. xxiv. p. 720.

Diplopelma pulchrum, Gthr.; Theobald, Cat. Rept. As. Soc. Mus. p. 83.

Head triangular; snout short, conical, and rounded, without canthus rostralis; nostrils near the extremity of the snout, directed upwards, outwards, and forwards. Body rather short. Limbs long, from the vent to the metatarsal tubercle one and a half times the length of the body. Two metatarsal tubercles, the outer one not very large, rounded, the internal one laterally compressed. Toes completely webbed, dilated, and truncated at the tips; fingers rather elongate, slightly dilated and truncated at the tips. Tongue elongate, ovate, entire behind. Tympanum hidden. Skin smooth.

"Dusky above and on the throat; rest of the lower parts reddish white; some black spots on the sides, and interrupted bands on the limbs. In young individuals a dusky bottle-like mark appears on the upper parts, with the neck of the bottle extending from between the eyes to between the shoulders. In adults this becomes inconspicuous, but is distinctly traceable." (*Blyth.*) Blyth's three types, stated by Theobald to be no longer in this museum, were identified by him as *D. pulchrum*. One accurately agrees with Blyth's measurements; and all tally with his description.

The longish legs and strongly webbed toes of this form would seem to separate it from this genus, which, however, I hesitate to do, as it agrees with it in all the following particulars:—It has the short snout, narrow gape, hidden tympanum, edentulous jaws and palate, elongately ovate, entire tongue, and free fingers of *Diplopelma*. Blyth says it appears to be common in Pegu.

DIPLOPELMA INTERLINEATUM, Blyth.

Engystoma (?) *interlineatum*, Blyth, Journ. As. Soc. Beng. xxii. p. 732, and xxiii. p. 720.

Snout short and pointed; nostrils near the tip of the snout. A fold of skin across the vertex from the posterior angle of the orbit, and continuous with the fold over the tympanum to the shoulder. Tympanum covered with the skin, but indistinctly seen. A strong fringed mucous fold across the roof of the mouth before the œsophagus. Tongue elongately oval, entire. Fingers with large subarticular tubercles; fourth finger about half the length of the third, and almost one-fourth shorter than the first; the second slightly longer than the first. Toes rather short, nearly one-third webbed, with prominent subarticular tubercles. Two metatarsal tubercles, not very prominent, the internal one more elongate than round, the one at the base of the fourth toe small and rounded. From the vent to the metatarsal tubercle is the length from the vent to the postorbital fold. Upper surface smooth, profusely covered with small pores. A few minute tubercles on the upper surface of the snout. Sides of the mouth, chin, throat, and thorax finely tubercular. Abdomen, under surface of thighs, and anal region densely and coarsely tubercular. A few small white tubercles on the throat, chin, and breast, with a prominent one on either side of the latter. Length 1″ 9‴, hind limb 1″ 11‴.

"Colour, a golden clay-brown above, with median blackish vertical streak, diverging into two at the nape, which are continued to the base of each hind leg; and when the hind leg is closed it appears to be continued on to the limb. Anteriorly to the eyes, a narrower branch passes over the orbit, and is also continued to the base of the hind limb; and a median duller line appears on the croup, which abruptly diverges towards the vent. Narrower intermediate lines are also traceable; and the principal streaks are set off by a pale golden edge. Limbs beautifully banded; the tarse dark posteriorly. Throat and breast blackish; the tuberculated belly and thighs tinged with yellow. Sides black, continued in a straight line from the nostrils and eyes, and strongly contrasting with a bright pale golden edge above."

Such is Blyth's description of the coloration of his type, which I have been unable to discover in this museum. In his description of his second specimen, from which the foregoing account has been derived, he mentions that "the markings in it are much less distinct, while a great pale-edged black spot has become intensely developed, adjoining the base of each thigh above. In the former specimen three black spots may be seen in process of development, at the ends of the two streaks which diverge from between the shoulders. In a male the entire upper parts are pale, and have a rosy tinge, with the same black spot conspicuously developed, while the remains of the longitudinal striæ are barely traceable. All are probably very beautifully coloured when alive."

In this specimen the general colour above is a pale violet earthy grey. A narrow dark violet brown band runs from the tip of the snout to the occiput, where it divides into two branches, which run backwards and outwards, and terminate at the base of the thigh in a large rich dark brown spot or drop, with a yellow margin. A smaller similarly coloured spot, internal and posterior to it at the base of the thigh above, and continued to the back of the thigh as a narrow violet-brown band; another longish linear spot external to it on the sides; faint indications (the specimen is much bleached) of some reticulated bands on the side of the occiput and sacral region; a broad violet-brown band from the eye through the tympanum along the side, with a pale yellow margin above; a few black spots on the oscilla; a narrow yellowish arched line from above the anus along the back of the thighs; thigh with three narrow oblique violet-brown bands, and the tibia barred or reticulated with the same colour; under surface dirty yellow, mottled with brownish on the tubercles of the chin, throat, and thorax.

This form has the edentulous palate and non-dilated toes of *Diplopelma*; in its general form, however, and in the strong fringed ridge across the palate it approaches *Callula*.

Hab. Pegu.

BUFO PANTHERINUS, Boie.

Crown of the head concave, without bony enlargement; no gland on the thigh; tympanum very distinct, nearly as large as the eye; parotoids slightly longer than the head, elongately kidney-shaped, moderately broad, not very prominent, without a black edge. Third finger longer than the fourth; toes half webbed, the membrane prolonged along the toes as a fine fringe nearly to the tips. Metacarpus with two coloured rather small tubercles, the innermost one being the largest. Numerous rather flat tubercles of different sizes, each capped with a small horny papilla.

Adults light greyish olive, with numerous dark olive-black spots, communicating and producing a reticulated appearance; spotted or obscurely barred with the same colour on the limbs, and with an obscure interrupted dark band between the eyes, and occasional indistinct traces of a pale vertebral line; below whitish.

All the young specimens are various shades of olive-grey or brown, whitish below. Length of adult 3 inches.

Hab. Agra district.

This species is closely allied to the European *B. viridis*, but its tympanum is large and distinct.

It appears to be common in the Agra district, where it is associated with *B. melanostictus*. With *Psammosaurus griseus*, this is the second African reptile which has been added to the fauna of the north-west within the last three or four years. Very little is known of the reptiles of the dry desert country to the south-west of Delhi and Agra; but further researches will in all probability prove that many more of its forms are African.

The similarity of the markings of the adults of this species to those of *Cacopus breviceps* is remarkable, and suggests that either one or the other may be an instance of mimicry.

BUFO MELANOSTICTUS, Schneid.; Gthr. *l. c.* p. 422.

Agra.

BUFO SIKKIMMENSIS, Blyth.

Bombinator sikkimmensis, Blyth, Journ. As. Soc. Beng. vol. xxiii. p. 300.

Scutiger sikkimmensis, Theobald, Cat. Rept. As. Soc. Museum, Calcutta, 1868, p. 83.

This remarkable Toad, which was referred by Blyth to *Bombinator*, has neither maxillary nor vomerine teeth. It is very closely allied to the true Toads, and only differs in its free toes and in its slightly notched tongue, which, however, resembles that organ in *Bufo* in its elongately ovate form, and in being free behind. It has no cranial ridges; and its parotoids, which stretch from the eye to the shoulder, are very narrow and linear. Its Eustachian tubes are not obsolete, as described by Theobald, but are very minute orifices placed close to the angle of the mouth. The character on which Theobald has founded the genus is an unfortunate one, as it is purely sexual and peculiar to the male. It consists of two plate-like callosities on either side of the thorax, thickly studded with minute dark-brown granules, such as occur on the same region in *B. liebigi* and other Batrachia. Similar to these structures is the rough, almost spiny surface on the upper aspect of the first and second fingers, and on the inner margin of the third. The female, as in other Batrachia, has no trace of these structures. There is in some an indistinct trace of an external ear. The canthus rostralis is round, and the nostril is situated rather below it, halfway between the eye and the end of the snout, which is short and round in front. The gape is about the length of the head. The surface of the head is slightly concave, due to a feeble swelling of the rounded canthus rostralis. The whole upper surface and sides of the body is densely covered with small glandular warts, among which many large ones are interspersed, bearing one or two little sharp horny spines, which are generally broken across, giving rise to Theobald's so-called apical pore; no large warts on the limbs; smooth below. The female is much less glandular than the male. The legs are rather short, as in *Bufo*. The first toe is very short; and the fifth is almost half the length of the fourth, and is very little shorter than the third; a fold of skin along the outside of the fifth toe. The fingers, as in *Bufo*, more slender in the female than in the male; the third finger longer than the fourth. The length of the body is equal to the distance between the vent and the base of the fourth toe.

The mere circumstance that the toes are not webbed does not appear to be a sufficient reason for separating this Frog from the ordinary Toads, which it resembles in all its other characters.

The specimen, the third that has been found, that has given rise to these remarks was procured on the Sengalula range, Darjeeling, at an altitude of 12,000 feet.

HYLORANA NIGROVITTATA.

Gymnodytes nigrovittatus, Blyth, Journ. As. Soc. Bengal, xxiv. pp. 718, 719.

Snout short, conical; canthus rounded; loreal region longitudinally concave; tympanum about one-fourth less than the long diameter of the eye. Vomerine teeth on two rounded eminences placed obliquely at some distance from the internal angle of the choanæ, converging, but widely separated. Tips of fingers and toes but slightly dilated. The first finger is slightly longer than the second, and the distal phalanx shorter than the fourth; the third has its distal phalanx longer than the fourth. Feet rather small. Toes feebly webbed, with the exception of the fourth; the fourth toe is one-half the length of the body. Two metatarsal tubercles, the inner one elongate, prominent, and the other rounded and conical. From the vent to the heel is very little less than the length of the body. Skin smooth, very finely tubercular on the sacral region and the upper surface of the legs and the back of the thighs around and external to the vent; a glandular fold from the eye, along the side of the back; an interrupted glandular fold from the angle of the mouth over the shoulder, but disappearing behind it; sometimes a few tubercles tending to a linear arrangement in front of the groin immediately below the dorsal line.

Pale plumbeous brown above (in spirit); in some a very obscure pale line along the lateral fold; a dark brown band from the eye along the side, with a darker margin below the glandular fold. On the sides in some, below this band, a few dark-brown spots between the axils, tending to form a second dark band, separated from the other by a broad pale interval. A dark line from the eye to the snout; upper lip dark anteriorly, paling to yellowish on the glands behind the mouth. Under surface dirty yellowish, obscurely spotted with brown in some; two longitudinal lateral brown streaks on the throat and thorax; back of the thighs and under surface of the legs strongly marbled with blackish over a yellowish ground; upper surface of thighs finely reticulately barred, and legs broadly barred with brownish; under surface of thighs brown-spotted.

No.	Length of body.	Snout from ant. angle of eye.	Hind limb.
1	2″ 0‴	$\frac{7}{24}$‴	3″ 2‴
2	1 9	$\frac{7}{24}$	3 0
3	1 $\frac{23}{24}$	$\frac{7}{24}$	3 0

No. 1 is Blyth's type. This species is closely allied to *R. macularia*, Blyth, from which it is distinguished by its shorter and less pointed snout, smaller feet, and coloration.

This species inhabits Pegu.

HYLORANA NICOBARIENSIS, Stoliczka, Journ. As. Soc. Bengal, xxxix. p. 150, pl. 9. fig. 2.

Habit slender. Snout rather narrow and tapering; upper jaw projecting but little beyond the lower; canthus rostralis triangular, rounded, with the nostril slightly below it, and much nearer the end of the snout than the eye; loreal region longitudinally concave; tympanum distinct, nearly as large as the eye. Vomerine teeth on two short feebly developed slightly oblique processes near the internal margin of the choanæ, but separated by a wide interspace. Tongue cordate, pointed anteriorly, and not very deeply notched. Disks small. Limbs slender and rather long. The first finger is almost as long as the fourth, and is about the same length as the second; the third is about one-third longer than the fourth. Subarticular tubercles large. From the vent to the heel is a little shorter than the body. The fourth toe is a little less than one-half of the body. Two rather small metatarsal tubercles; the inner one short and oblong, and the outer one round and but little smaller than the former. Toes rather feebly webbed, the membrane reaching to the extremities of the third and fifth toes. Skin quite smooth. Dr. Stoliczka gives the following measurements of the two largest specimens:—

	♂ in.	♀ in.
Length of body	2	1$\frac{14}{16}$
Distance from vent to heel ..	1$\frac{12}{16}$	1$\frac{12}{16}$
Length of fourth toe	$\frac{15}{16}$	$\frac{15}{16}$
Total length of hind limb ..	3$\frac{4}{16}$	3$\frac{3}{16}$

He describes the colour above as olive greenish, much darker and almost black in some male specimens; upper glandular folds pale; upper lip whitish; lower glandular tubercles usually pure white; sides of body, including the loreal region, black, which uniform colour, however, fades on the posterior part of the body, and is sometimes replaced there by a few dark spots; lower parts more or less mottled with black, sometimes almost wholly black in the males, but yellowish between the thighs; in the females the lower parts are whitish, either uniform or only slightly dusky; fore limbs with few indistinct cross bands; a dark streak in front of the upper arm, and another one behind, as well as on the lower arm; hind limbs above banded with brown, behind indistinctly mottled with dark and yellow.

Dr. Stoliczka was at first inclined to regard this species as a variety of *H. tytleri* (? *erythræa*), from which he now considers it to be distinguished by its "larger tympanum, the usual total want of the short downward bent lower glandular fold, the better-developed disks of the fingers and toes, the greater length of the third finger, the presence of two almost subequal metatarsal tubercles, its distinctly larger gape, and more distant vomerine ridges."

Hab. Nicobar Islands.

POLYPEDATES MACULATUS, Gray; Gthr. *l. c.* p. 428.

The Darjeeling specimens of this Frog now before me are all more or less distincty spotted on different shades of grey. The largest is pale, almost cream-colour, with very indistinct spots, and no trace of a band between the eyes, and without an hourglass-marking. The brown band along the canthus rostralis and over the tympanum, however, is very distinct. The other two specimens are dark slaty, with indications of the hourglass-marking on the anterior part of the back; and in both the transverse band between the eyes faintly shows.

This is not an uncommon species about an elevation of 3000 feet in Sikkim, and is chiefly found among long grass, and not, as its name (Tree-Frog) would lead us to expect, on trees. This is the case also with *Rhachophorus maximus*, which is found in similar situations, also in ponds and wells. It likewise possesses the power of changing its colours.

POLYPEDATES QUADRILINEATUS, Wiegm.

The dark bands are very narrow and not very distinct; and the black edging can hardly be said to exist. The bands also show a tendency to break up posteriorly, and over the sacrum they are reduced to small black spots. The black band from the snout and over the tympanum is prolonged along the side to almost halfway between the axilla and groin, but behind that it is reduced to widely distant black spots with white edges. The general colour is a pale olive-grey; the bars on the legs and the marbling on the back of the thighs are well marked, especially the latter. A dark band edged anteriorly with white runs along the back of the fore-arm to the little finger; the under surface of the lower jaw is finely speckled with brown. The vomerine teeth are in convergent series. The surface of the head between the orbits concave; roughish surface above each canthus rostralis and between the orbits, and extending along the occiput, enclosing a smooth triangular space; no transverse ridges. Length 2″ 9‴; thigh 1″ 5‴; calf 1″ 5‴; heel 9‴, to fourth toe 1″ 1‴.

This specimen appears to be intermediate between true *P. quadrilineatus* and *P. maculatus*; but the black lines on its back and other characters affine it to the former.

Gowhatty, Assam, considerably below 2000 feet.

POLYPEDATES SMARAGDINUS, Blyth, Journ. As. Soc. Beng. vol. xxi. p. 355; Jerdon, Proc. As. Soc. 1870, p. 83.

Blyth merely says, "A Tree-frog from the Naga hills, Assam (*P. smaragdinus*, nobis). Length of the body 3¼ inches, hind limb 5¼ inches. Wholly green above, changing in spirit to livid blue; underparts white." Dr. Jerdon is not more explicit about the form which he supposes to be Blyth's *P. smaragdinus*; for he merely says that it is "A very large green-backed Frog." Dr. Jerdon has presented his specimens to this museum; and I take this opportunity to describe them.

Body moderately long and slender; legs very long and slender. Head rather broad, upper surface slightly concave on the mesial line; distinct canthus rostralis; loreal region concave; snout of moderate length, rounded in front; tympanum distinct, a little more than half the diameter of the eye. Vomerine prominences placed nearly transversely across the palate, from the inner angle of the choanæ, from which they are separated by a short interval, convergent behind, but not in contact. A single line of from nine to twelve short nodular teeth. Skin quite smooth throughout; skin adherent to the surface of the head; indications of a curved osseous crest. No enlarged tubercles below the anus; no appendage to the heel. The body is one-seventh the distance between the arms and the heel, shorter than the length between the two points. Fingers with a very rudimentary web; disks large, considerably larger than those of the toes, which are broadly webbed, the membrane reaching to the disk.

The upper surface is pale livid blue (spirit specimen); under surface of chin, throat, and chest brownish, the rest yellowish. A dark brown band through the loreal region and along the sides of the groin. Upper jaw with a white line from the snout, below the eye and tympanum, passing behind the axilla to the ventral surface. Sides marbled brown and yellow; legs with broad brown bars; back of thigh marbled with yellow and brown; arms slightly marked with brown bars and spots. Two youngish specimens have a single longitudinal series of black spots over the vertebral line, with faint indications of others. Length of body 3″ 2‴; hind limb to heel 3″ 8‴; heel to extremity of largest toe 2″ 6‴.

I am not at all satisfied that this is more than a variety of *P. maculatus*.

POLYPEDATES MARMORATUS, Blyth, Journ. As. Soc. Beng. xxiv. p. 188; Gunther, *l. c.* p. 428.

Polypedates afghana, Gthr.; Jerdon, Proc. As. Soc. 1870, p. 84.

Habit rather stouter than *P. maculatus*. Snout of moderate length, not depressed, moderately pointed; canthus rostralis distinct; nostril slightly below the canthus rostralis; loreal region rather deeply concave and granular. Eye large and prominent. Tympanum very small, smaller than the disk of the third finger. Vomerine teeth on two transverse ridges, on a line with the posterior margin of the choanæ. Skin above densely covered with small tubercles, with white apices. A large white tubercle on the middle of the head between the anterior angle of the eyes; a few large glandular-like tubercles above the tympanum on the sides and behind the angle of the mouth. Belly and back of thighs finely tubercular. Fingers free, with the disks very large. Toes completely webbed, with the membrane extending to the disks; metatarsus with a small oblong tubercle. From the vent to the heel is considerably longer than the body.

Colour (in spirit) pale yellowish, with large spots with black centres, paling towards the margins of the spots, so that they become confluent; a few white spots interspersed among them. Under surface yellowish, spotted with dusky on the chin, throat, and chest. Lips and limbs broadly barred with blackish, the barring on the legs extending on to the fingers and toes.

Adult (Blyth's type), 3″ 3‴ in length; limb 5″ 7‴. Pegu.
Adult (Darjeeling), 2″ 8‴ in length; limb 5″ 1‴.

Blyth's specimens were from Pegu; I also obtained it at an elevation of 3000 feet on the Kakhyen Hills, in the north-east of Burmah, on the confines of China; and other specimens are from the neighbourhood of Darjeeling, at an height of 3000 feet.

POLYPEDATES HASCHEANUS, Stoliczka, Journ. As. Soc. Beng. vol. xxxix. p. 147, pl. ix. fig. 3.

This is a small species, perhaps the smallest known form of the genus, measuring only $\frac{15}{16}''$, and the hind limb $1\frac{9}{16}''$. The head is rather large compared with the length of the body; and its breadth is indicated by the circumstance that the distance between the eyes is nearly the length of the moderately long snout. The vomerine prominences are small rounded nodules, their anterior margins being almost on a level with the posterior margin of the choanæ, from which, and also from one another, they are widely separated. Dr. Stoliczka describes an indistinct dorsal glandular fold on the fore part of body, which is clearly traceable on the posterior half of it. The existence of such a structure would lead us to refer this Frog to *Hylorana* and not to *Polypedates*; but on carefully examining Dr. Stoliczka's specimens in this museum, I fail to detect the slightest indication of a dorsal glandular fold. The fold over the tympanum is well developed, and the disks of the fingers and toes are moderately large.

Dr. Stoliczka describes the species as of very active habits, and states that he found it tolerably common in the forests on the Penang Hill, about 1000 feet above the sea.

POLYPEDATES ANNECTENS, Jerdon, Proc. As. Soc. Beng. 1870, pp. 83, 84.

Habit moderately slender. Head rather broad, slightly depressed; snout short and rounded; canthus distinct, rounded; loreal region nearly vertical, slightly concave; nostrils near extremity of snout; distance between the eyes as long as the snout; tympanum distinct, about one half the long diameter of the eye. Vomerine teeth on two prominent rounded processes, close to the internal margin of the choanæ, with a narrow interspace between them. Tongue cordate, almost entire behind, or with a very faint notch. Disks rather well developed. Limbs of moderate length. Fingers with a distinct membrane at their base; first finger small, little more than one-half the length of the fourth; second about one-third shorter than the third; fourth a fourth shorter than the third. From the vent to the metatarsal tubercle is a little longer than the body; a short oblong metatarsal tubercle. Toes one-half webbed; the first toe small, one-half the length of the second. A strong glandular fold from the eye over the tympanum to the shoulder, and prolonged slightly beyond the latter. Smooth above, densely granular below, and on the under surface of the thighs.

Above uniform dark greenish violet; a very narrow pale line from above the shoulder, prolonged downwards and backwards on to the side, expanding in its latter half into the yellow of the abdomen, with a few intensely black spots, in linear series, on the sides, in and before the groin; a broad dusky band below the anterior half of the narrow white line. Under surface and back of the thighs bright yellow, the latter with large black spots; a few on the anterior margin of the tibia and tarsus. Length $1''\ 7'''$; hind limb $2''\ 7'''$.

Hab. Khasi Hills.

Dr. Jerdon observes of this species that it forms a link between this genus and *Rhacophorus*, having the basal portion of the fingers webbed; but the fingers of *P. pleurostictus* and *P. reticulatus* have the membrane quite as well developed as in the present form. The partial prolongation of its supratympanic fold on to the sides of the body would seem to indicate that its affinities were more in the direction of *Hylorana*.

RHACOPHORUS MAXIMUS, Gthr.; Günther, *l. c.* p. 435.

This species appears to be common throughout North-eastern Assam, and southwards to the Khasi Hills, but to be rather scarce in Sikkim; for out of a large collection of Frogs from thence I have only obtained one specimen, while in collections from Eastern Assam it is one of the prevalent forms. It is associated in the Khasi Hills with *R. maculatus*. Its extension as far east as Afghanistan seems doubtful. The specimen which Günther refers to as coming from Afghanistan probably had a similar history to the specimen of

Oligodon dorsalis, which was doubtfully referred to Afghanistan because it happened to have been found in Griffith's collections. Griffith, however, made his most extensive collections in Assam, Upper Burmah, and the Khasi Hills; and it seems to be probable, from such facts as these of *O. dorsalis* and this species, that his Afghanistan collections have been mixed up with the former.

This Frog attains a large size, the largest specimen before me measuring 4″ 2‴; hind limb 6″ 5‴.

The vomerine teeth are on two prominent transverse ridges from the anterior internal angle of the choanæ, with a wide interval between them. The canthus rostralis is well marked in the adult, and the nostril is slightly below it, near the end of the snout. The diameter of the tympanum is more than two-thirds the long diameter of the eye. The skin is smooth, but the supratympanal and orbital and posttympanal regions are finely granular, and the abdomen and under surface of the femora, and sometimes the upper surface of the latter, are granular. From the vent to the heel is the length of the body.

Above uniform violet, in spirit; under surface brownish, darkest on the sides when in contact with the colour of the back, from which it is occasionally separated by a paler violet band. The brown of the sides in others is densely spotted with darker brown. The under lip is yellow.

I have examined twenty specimens of this Frog of all ages.

Callula pulchra, Gray; Gthr. *l. c.* p. 437.

Some years ago I obtained two specimens of this handsome Frog in the Botanical Gardens, Calcutta; but I have never succeeded in procuring another. The largest specimen in this museum is 2″ 9‴ in length, the hind limb being 2″ 8‴. Not uncommon in Upper Burmah.

4. On eight new Species of Birds from Western Yunan, China. By John Anderson, M.D., F.L.S., F.Z.S., &c., Director of the Indian Museum, Calcutta.

[Received February 8, 1871.]

(Plate XI.)

Suthora brunnea, n. sp.

Supra fusco-olivacea: pileo et nucha rufo-ferrugineis: mento, gula et pectore roseo suffusis, et leviter fusco-striatis; abdomine fusco-flavo; hypochondriis crissoque olivaceo-brunneis: alis et cauda brunneis: remigibus primariis et rectricibus flavo-olivaceo tenuiter et pallide marginatis.

Long. tota 5·20, alæ 2·15, caudæ 2·74, rostri a rictu ·35, a fronte ·35, tarsi ·84 poll. Angl.

Hab. Momien, Yunan, ad alt. 4500 ped. Angl.

Above brownish olive, head and nape rich reddish ferruginous; chin and throat as well as the breast suffused with rosy, and faintly striated with brown; middle of abdomen buff; sides of abdomen and under tail-coverts dusky olive-brown; wings and tail brown; primaries and tail-feathers narrowly and faintly margined with yellowish olive.

This species is closely allied to *S. bulomachus*, Swinhoe, with the figure of which I have compared it, and from which it differs in the following particulars; viz. the red of the head and neck is much more intensely marked in this species, the centre of the abdomen is buff, and there is *no red on the wing*. The latter character also separates it from *S. webbiana*.

CISTICOLA MELANOCEPHALA, n. sp.

C. *pileo nigro, plumis rufo obscure marginatis: nucha rufa, brunneo obscure striata: loris et superciliis pallide rufis: dorso et uropygio nigris, plumis rufo-cinereo marginatis: cauda supra brunnea, obscure fasciata, subtus cinerea obscure fasciata, apice nigro maculata et rufo-cinereo pallide terminata: caudæ tectricibus inferioribus ferrugineis: alarum tectricibus brunneis, pallido rufo marginatis: remigibus brunneis, rufo marginatis, subtus albo-ferrugineo tinctis: hypochondriis ferrugineis.*

Long. tota 4·35, alæ 1·70, caudæ 2, tarsi ·72, rostri a fronte ·52, a rictu ·37.

Hab. Sonda, Yunan, ad alt. circiter 1700 ped. Angl.

Head black, feathers obscurely margined with rufous; lores and supercilium pale rufous, faintly striated with brown; back and rump black, feathers margined with rufous cinereous; tail brown above, obscurely banded, cinereous below, obscurely banded, black-spotted near the apex and tipped with pale rufous cinereous; under tail-coverts ferruginous; wing-coverts brown, faintly margined with rufous; quills brown, edged with rufous; below ferruginous albescent.

The intense black of the centres of the feathers of this species and the almost entire absence of light-coloured margins to the feathers of the head separate it from *C. schœnicola*. I have specimens of the latter bird from Central India with much lighter rufous about them than the ordinary run of Bengal and Cachar specimens; and the top of the head, instead of being nearly uniform dull rufous-brown, as in Bengal specimens, is bright pale rufous with narrow brownish-black centres to the feathers, and the two colours have a tendency to dispose themselves in lines. My Cachar specimens resemble those from Bengal in every respect.

From shrubby jungle on the hill-sides behind Sonda.

SAYA SUPERCILIARIS, n. sp.

Supra olivaceo-brunnea: plumis pilei et nuchæ obscure nigro lavatis: superciliis albis: loris nigris; mento, gula et pectore albis, subrufescentibus: pectore indistincte nigro maculato: abdomine et crisso rufo-brunneis; remigibus et tectricibus brunneis, rufo marginatis: rachibus rectricum nigris.

Long. tota 7, alæ 1·87, caudæ 4, tarsi ·85, rostri a rictu ·60, a fronte ·44.

Hab. Momien, Yunan, ad alt. circiter 5000 ped. Angl.

The bright supercilium and the faintly black-spotted breast are the distinguishing characters of this species.

Olive-brown above, the head and nape faintly washed with black; supercilia white; lores black; chin, throat, and breast white, tinged with rufous; breast indistinctly spotted with black; abdomen and under tail-coverts reddish brown; wings and tail brown, margined with rufous; shafts of the tail-feathers black.

CULICIPETA TEPHROCEPHALUS, n. sp.

C. *similis* C. burkii *sed pileo et nucha cinereis, lateribus lororum nigro fasciatis.*

Alæ 2·10, caudæ 1·90, tarsi ·72, rostri a rictu ·54, a fronte 4.

Hab. Bhamo, Burmah.

This species resembles *C. burkii*, but has the head and nape cinereous, with a black band along their lateral margin, as in *C. burkii*. The latter is slightly duller green.

HYPSIPETES YUNANENSIS, n. sp.

H. *nigra : pileo, cervice et interscapularibus nigro-metallicis : dorso medio uropygioque fusco-nigris, cinereo tinctis : plumis cinereo pallide marginatis : tectricibus caudæ superioribus fusco-nigris, cinereo pallide tinctis : subtus fusco-cinerea, brunneo-nigro notata ; abdominis lateribus cinereo-plumbeis : tectricibus caudæ inferioribus cinereis albo marginatis : tectricibus alarum brunneo-nigris : remigibus et rectricibus nigro-brunneis et remigibus cinereo tenuiter limbatis.*

Long. tota 10, alæ 5, cauda 4·50, tarsi ·70, rostri a rictu 1·16, a fronte ·90.

Hab. Ponsee, Yunan, ad alt. circiter 3500 ped. Angl.

Black; head, neck, and interscapular region metallic black; middle of back and rump dusky black, tinged with cinereous; the feathers margined with cinereous; upper tail-coverts brownish black, feebly tinged with cinereous; below dark cinereous spotted with brownish black; sides of the abdomen slaty cinereous; under tail-coverts ashy margined with white; wing-coverts brownish black; wing and tail blackish brown, the primaries narrowly margined with cinereous; bill, legs, and feet coral-red, claws dusky; irides bright reddish brown.

This bird is intermediate between *H. psaroides* and *H. ganeesa*, but is most closely allied to the latter. It is also nearly allied to *H. nigerrima*, Gould, with which I have compared it. It is a larger bird than any of the foregoing species. It is also a much greyer bird generally than the *H. perniger*, Swinhoe, and considerably larger.

Blyth's *H. concolor* is so imperfect in every way that I do not attempt to supplement his meagre description.

I have all the species of this group before me, and agree with Blyth that *H. neilgherriensis*, Jerdon, is the same as *H. ganeesa*, Sykes; and I believe it to be extremely doubtful whether the latter is distinct from *H. psaroides*, but I have not sufficient materials to decide this question.

I have a specimen of *H. psaroides* from Simla so light-coloured on the under surface that it might be correctly described as pale slaty white.

BAMBUSICOLA FYTCHII, n. sp. (Plate XI.)

♂. *Pileo brunneo-ferrugineo: fascia lata superciliari in fronte conjuncta utrinque elongata, albescenti-cinerea; fascia pone oculos nigra: auchenio cinnamomeo: interscapularibus et tectricibus alarum cinereo-olivaceis, maculis subtriquetris rufo-brunneis, nigro terminatis et plumis brunneo-nigro obscure lineolatis: dorso, uropygio et tectricibus caudæ superioribus cinereo-olivaceis, nigro-brunneo transversim obscure nitideque notatis vel subfasciatis, interdum nigro parce maculatis, maculis triangularibus albescente cinereo terminatis: rectricibus cinnamomeis, duabus mediis nigro-brunneo undulatim fasciatis, fasciis ochraceis pallide marginatis: duabus sequentibus nigro-brunneo obscure lineolatis: loris, mento gulaque pallide ochraceis: jugulo rufo-ochraceo et cinnamomeo longitudinaliter vario: pectore lateribusque ejus cinnamomeis alboque ocellatis et nigro parce maculatis: pectore, ventre crissoque pallide rufescenti-albis, maculis magnis subrotundatis et nigris: hypochondriorum plumarum maculis permagnis et triangularibus: remigibus cinnamomeis, secundariorum marginibus externis brunneo et cinereo obscure marmoratis: remigibus tertiariis rufo-brunneis, apicibus extensis nigris et albescente cinereo tenuiter marginatis: marginibus externis cinereo et albo tenuiter marmoratis.*

Long. tota 12, alæ 5·80, caudæ 4·20, tarsi 1·58, rostri a rictu 9·5, a fronte ·86.

♀. *Cauda magis brunnea: fascia post oculos cinnamomea: calcari minuto.*

The structural characters of this bird are decidedly *Bambusicoline*; but it is related in its colouring to *Arboricola*. Gould describes the spur of *B. sonorivox* as blunt; but it is very sharp in this species, and is indicated in the female by a small tubercle. The female is also distinguished from the male by the postorbital band being cinnamon instead of black.

I procured this bird from the old rice-clearings on the hill-sides of Ponsee, at an elevation of 3000 feet.

PYCNONOTUS XANTHORRHOUS, And. Proc. As. Soc. Bengal, 1869, p. 265.

Ixus andersoni, Swinhoe, Ann. & Mag. Nat. Hist. vol. v. ser. 4, 1870, p. 175.

Mauwyne, Yunan, 1700 feet; Ichang, Yangtsze river (*Swinhoe*).

PHASIANUS SLADENI, MS.

Phasianus sladeni, MS. Anderson; Elliot, P. Z. S. 1870, pp. 404, 408.

Phasianus elegans, Elliot, Ann. & Mag. Nat. Hist. Oct. 1870, p. 312.

Momien, Western Yunan, 4500 feet; South-western Szechuen (*Elliot*).

5. Descriptions of three New Species of Diurnal Lepidoptera from Western Yunan collected by Dr. Anderson in 1868. By W. S. Atkinson, M.A., F.L.S., &c., Director of Public Instruction, Bengal. (Communicated by John Anderson, F.L.S., F.Z.S.)

[Received February 7, 1871.]

(Plate XII.)

1. Æmona lena, sp. nov. (Plate XII. fig. 1.)

Upperside:—*Fore wings* pale brownish grey, crossed by a dark brown band, interrupted by the nervures from before the apex to near the posterior margin at two-thirds of its length from the base, beyond the band darker, with a slightly marked and incomplete submarginal line, before which is a series of five pale lanceolate blotches between the nervures directed towards the outer margin. All the nervures tinged with yellow and more or less dark-bordered. *Hind wings*: anterior portion from base to outer margin pale, posterior portion bright yellow, crossed by a submarginal series of three dark-bordered white blotches, and a fourth fainter blotch between the nervures, forming a short interrupted band from near the apex to the second median nervure. The submedian nervure fringed from its origin to near its extremity with long yellowish hairs, longest and most conspicuous towards its extremity.

Underside:—Both wings crossed by a dark ferruginous band with sharply defined outer edge from the costa of the fore wing near the apex to near the extremity of the submedian nervure of the hind wing, and having a faintly traced submarginal line, before which is a series of blind white-centred ocelli. The cell of the fore wing crossed near its middle by a curved ferruginous band. Hind wing crossed by a ferruginous band near the base.

Antennæ ferruginous; palpi and legs tawny yellow.

Expanse of wings 3¼ inches.

Hab. Yunan. Collected by Dr. J. Anderson, 1868.

2. Zophoessa andersoni, sp. nov. (Plate XII. fig. 3.)

Upperside brown. *Fore wing* crossed by two pale bands rising from the costa and directed towards the posterior angle, but not reaching it; the first beyond the extremity of the cell, the second intermediate between the first and the exterior margin. *Hind wing* with a pale submarginal belt containing a series of incomplete ocelli. The first and third median nervures produced into short tails.

Underside bright ferruginous. *Fore wing* crossed by three silvery-white bands; the first cutting the middle of the cell at right angles, the second and third corresponding to the pale bands on the upperside. Exterior to the third band a series of rudimentary ocelli reduced to four dark points. The exterior marginal lines bordered within by yellow. *Hind wing* crossed by two silvery-white bands; the first cutting the lower part of the cell and corresponding to the first band of the fore wing, the second equidistant between the first and the exterior margin, and corresponding to the second band of the fore wing; at either end of the second band and within it are ocelli, the upper with one and the lower with two white pupils ringed with black. Exterior to the second band a series of four white-pupilled ocelli, their outer edge forming an interrupted yellowish-white band. The exterior margin sharply defined by two fine black lines divided by a yellow line, and bordered within by bright yellow. Fringe yellow.

Antennæ brown, with ferruginous tips.

Expanse of wings 2¼ inches.

Hab. Yunan. Collected by Dr. J. Anderson, 1868.

3. PLESIONEURA LILIANA, sp. nov. (Plate XII. fig. 2.)

Upperside dark fuliginous brown. *Fore wing* crossed from the middle of the costa to the posterior angle by a broad white semi-transparent band irregularly angled outwardly and narrowing from the middle hindwards. A recurved series of five angular white spots between the band and the anterior angle. Fringe brown, with a grey spot below the anterior angle, and two others near the posterior angle. *Hind wing* without markings, the fringe barred with greyish white between the nervures.

Underside:—*Fore wing* with band and spots as above, but suffused with grey scales towards the apex, and pale towards the posterior angle below the band. *Hind wing* suffused with greyish scales and crossed by irregular broken bands of grey, which give it a mottled appearance; two white dots near the base.

Palpi grey below, brown above.

Expanse of wings 2¼ inches.

Hab. Yunan. Collected by Dr. J. Anderson, 1868.

DESCRIPTION OF PLATE XII.

Fig. 1. *Æmona lena*, p. 215.
2. *Plesioneura liliana*, p. 216.
3. *Zophoessa andersoni*, p. 215.

6. Notes on the Monkeys of Eastern Peru. By EDWARD BARTLETT. (Communicated, with Notes, by P. L. SCLATER.)

[Received February 10, 1871.]

(Plate XIII.)

During my recent four years' sojourn on the Upper Amazons I met with the following species of Monkeys:—

1. ATELES VARIEGATUS, Wagner (*A. bartletti*, Gray, P. Z. S. 1867, p. 922, pl. xlvii.). Variegated Spider Monkey.

On my arrival in Peru in 1865 Mr. Hauxwell told me of the ex- ce of a large species of *Ateles*, which he had killed but failed to e. He told me that he met with it on the Rio Tigri, a small that runs into the Amazons about four miles above the Nauta, on the north-western shores of the Peruvian Amazon. hat during the fourteen years he had traded he never found ies in any other locality. On my return from the River , in September 1865, I wished to ascend the Rio Tigri in t of this Monkey, but was obliged to abandon the idea on ount of the prevalence of fever and ague at that season; and, moreover, the Indians were unwilling to join me in so dangerous a country. Having then determined to spend some few months in the mountain-country, I passed up the Marañon and Huallaga to Yurimaguas, and so on to Xeberos, whence I went on to the town of Chyavitos, in the mountains. Having heard that this large Monkey was to be met with in this little-known locality, I remained at Chyavitos about two months; and during that time I became well acquainted with the Indians, who informed me that a long-armed Ape (called in the Inca language *Urcu Maci-suppah*, or *Quillu Maci-suppah*) was to be met with at a distance of three or more days' journey. I engaged three active Indians, and started by way of a forest footroad that had been opened by a Catholic priest to the town of Moyabamba as part of his penitence. At the end of three days I reached the highest point of the mountains; here we came across a number of the Monkeys in question—about eight or nine. I shot the male that is now in the British Museum; my Indian brought down another with the poison-dart. Having obtained two of them, I felt perfectly satisfied that I had discovered a new species. While, however, I was busily engaged preparing the finest specimen, my Indians had quietly placed the other on the fire; to my great horror and disgust they had singed the hair off, and thus spoiled my second specimen. Of course I was obliged to keep peace, for we had not tasted meat for some days before starting from Chyavitos, and this Monkey proved a very dainty dish to us all.

I was still in hopes of obtaining more specimens in the Munga-Urcu, or Saucepan Mountain (so called from its peculiar shape), but in this, after much hard work, I failed.

These Monkeys appear to go in small parties, passing through the forest at a rapid pace, feeding on different kinds of berries. The berries I found in the mouth and stomach of the male were similar to the gooseberry in external appearance; they have, however, a large stone inside. These stones appear to pass through them, as I found several in the intestines.

On my return to the town I found an Indian who had arrived from Cauhapanas, a small town lying at the foot of the mountains in the Marañon valley, north-west of the town of Chyavitos, who had in his possession a very fine young Spider Monkey, which proved to be of this species. It was nearly black, but just showing the light golden hair coming on the underside of the body and tail, some few white hairs on the cheeks, and slight golden crest, sufficient to identify the species. I bought it of the Indian, and managed to brin
alive to Yurimaguas, where it died.

On my arrival I was informed by some of my old India
they discovered this Monkey during my absence on tl
Huallaga (on the south-eastern shores). One of the Ind
that he brought three young ones alive, which died soon
arrival in the town. I here give an idea of the great r
Monkey inhabits, owing to the ease with which a beast that
his long arms and tail may travel a country of this description.
found on both sides of the Peruvian Amazon (or Marañon), on bo
shores of the Huallaga, and in the interior forest near the town of Chamicuros. I was told by some of the oldest Indians that these animals are common in the dense forest on the hills near the latter town, their range running between the Huallaga river and Ucayali river to the head-waters of the Huallaga, between the towns of Lamas and Sarayagu. Here they occupy the interior forest, and appear to be common, according to accounts given me by Indians of that country—as also on the lower spurs of the mountains between the town of Moyabamba and the Huallaga river.

Then, again, on the Rio Tigri, north-western shores of the Great Marañon, there is not the slightest doubt that this species is to be found ranging along the lower spurs of the Andes, across Ecuador and Columbia, over the head-waters of the Rio Napo, Rio Japura, and Rio Negro, where Natterer first discovered it.

2. ATELES ATER. Black-faced Spider Monkey.

The Black-faced Spider Monkey inhabits the forests on the Ucayali, Chamicuros on the Huallaga river, and is found over the whole of the valley of the Amazons, generally keeping to the low districts.

I shot an adult male at Chamicuros which had the inner part of the thighs and belly very grey or grizzled.

This is the only species of *Ateles* obtained in large numbers by the Indians, who frequently keep them as pets. These Monkeys travel in bodies of perhaps thirty or forty together.

This and *A. variegatus* are, so far as I know, the only Spider Monkeys which are found in the district which I explored.

3. LAGOTHRIX INFUMATUS*. Brown Lagothrix.

This large Monkey is found on the rivers Ucayali and Huallaga, and over the whole of the valley of the Peruvian Amazons. It is very common in the forests in the low country. They are met with in pairs; sometimes from four to six pairs are found to inhabit the same large trees. Not unfrequently they are in company with the *Mycetes*.

These Monkeys are much sought after for food; and from their great abundance are extensively used for this purpose by both Indians and whites.

4. MYCETES SENICULUS†. Golden Howler.

This Howler furnishes the principal animal food used by the inhabitants of the borders of the rivers Ucayali and Huallaga. These Monkeys keep to the low lands and the shores of the rivers, always travelling in pairs. When a *Mycetes* is shot it always hangs to the tree, even if quite dead, and does not fall down until some hours afterwards, when the muscles become relaxed. Therefore, if fresh food is an immediate object, it is better to kill a *Lagothrix*, in which this peculiarity does not occur.

5. SAIMARIS USTUS, Is. Geoffr.

This is a common species, inhabiting the whole of the Peruvian Amazons, and may be met with on every stream. They are frequently seen moving about in large numbers through the forest.

6. CALLITHRIX CUPREA, Spix‡. Red Tee-tee.

This Monkey is equally widely distributed, but not so numerous,

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* [Mr. Bartlett has submitted four skins of this species to my examination. In those marked males the size is rather larger, the black hair on the breast and belly much more developed, and the back more greyish. The skins measure:—

1.	♂	Long. corp.	25 unc.,	caudæ	23 unc.,	tota	48·0	unc.
2.	♂	,,	24 ,,	,,	22 ,,	,,	46·0	,,
3.	♀	,,	20 ,,	,,	23 ,,	,,	43·0	,,
4.	♂ jr.	,,	20 ,,	,,	23 ,,	,,	43·5	,,

I do not doubt this being the *Gastrimargus infumatus* of Spix; and as they were obtained in the same district as *Lagothrix castelnauii* of Is. Geoffroy and Deville (Casteln. Exp. p. 5, pl. 1), I am inclined to agree with Wagner (Säugeth. v. p. 73) in considering the latter not really distinct.—P. L. S.]

† [I consider *Simia ursina* of Humboldt (established on specimens from Caraccas) to be identical with the species commonly called *Mycetes seniculus* (i. e. *M.* saturate castaneo-rufus unicolor; dorso medio fulvo). But *Mycetes ursinus* of P. Max. and other authors, of the wood-region of S.E. Brazil, is certainly different, and should be called *M. fuscus* (*cf.* Wagner, Abh. bay. Ak. v. p. 409). Mr. Bartlett's skin from Chamicuros seems to me to be referable to the true *M. seniculus*—a species not heretofore certainly known to extend into Eastern Peru. But Mr. Bartlett tells me this is the only *Mycetes* which he met with.—P. L. S.]

‡ [I consider Wagner (Säugeth. v. p. 114) quite right in referring *C. discolor* of Is. Geoffroy to *C. cuprea* of Spix. Spix gives the Upper Amazons, frontiers of Peru, as its locality. Deville's specimens of *Callithrix discolor* were obtained from Sarayaçu and other places in the same district as that which Mr. Bartlett has collected in.—P. L. S.]

as the last-named species; in fact it may be regarded as rather rare. I obtained specimens of it at Cashiboya on the Ucayali, and Santa Cruz on the Huallaga.

7. NYCTIPITHECUS OSERYI *, Is. Geoffr. et Dev.

I found this species on the Ucayali and Huallaga rivers. It is generally distributed on the Peruvian Amazons, but is by no means common. It is quite nocturnal, coming out in search of food only after dark, and is consequently difficult to obtain.

My specimen is from Yurimaguas on the Huallaga.

8. PITHECIA MONACHUS, Geoffr.

This Monkey is but rarely met with on the Peruvian Amazons. I obtained an adult male, female, and young at Chamicuros, an inland town on the Huallaga. These were the only three I met with myself; but I saw others in possession of the Indians.

9. HAPALE PYGMÆA (Spix). Pigmy Marmoset.

This pretty little Monkey is extremely rare and difficult to obtain. I shot only one specimen at Santa Cruz, on the Huallaga river, the only locality in which I have met with it.

10. MIDAS DEVILLII †, Is. Geoffr. (Plate XIII.)

This is the only species of *Midas* met with by me in Eastern Peru. It is plentiful everywhere on the Peruvian Amazons; and I obtained specimens both on the Huallaga and Ucayali. The sexes hardly differ, the male being merely rather larger and darker, especially on the head and nape, where the hair is longer.

This species is extremely delicate and will not bear the least cold. I have had them alive for two or three weeks; but they appear to suffer from cold and die. They are kept, however, by the Indian women, who make pets of them, and put them into the long hair on their heads; with this protection they are able to live for a long time. Having become tame, they frequently hop out and feed, or having captured a spider or two scamper back again and hide under the luxuriant crop of their owners, who are generally unwilling to part with them.

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* [Mr. Bartlett's skins of *Nyctipithecus* are, in my opinion, certainly referable to *N. oseryi*. But I have little doubt that this is the same as *N. vociferans* of Spix obtained at Tabatinga.

Wagner (Säugeth. v. p. 108) refers *N. vociferans* of Spix to *N. lemurinus* of Columbia, which can hardly be right geographically.—P. L. S.]

† [Three skins of a *Midas* in Mr. Bartlett's collection are certainly referable to this rare species, of which MM. Castelnau and Deville obtained two specimens only at Sarayaçu.

Their figure (Castelnau, Exp. Mamm. t. 6. fig. 2) not being very accurate, and having been taken, as is stated, from imperfect specimens, the figure herewith given (Plate XIII.) will be acceptable.—P. L. S.]

March 7, 1871.

Professor Flower, F.R.S., V.P., in the Chair.

The following papers were read:—

1. Notes on rare or little-known Animals now or lately living in the Society's Gardens. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.—Part I. Mammalia.

[Received February 17, 1871.]

(Plates XIV.–XVII.)

In preparing for publication a fifth edition of the list of vertebrated animals in the Society's Gardens, on which I am now engaged, I have found it necessary to make researches into the history of some of the rarer and less-known species that have been represented in the Menagerie during the past ten years, and I beg leave to offer to the Society some remarks upon them.

The present part of my communication will relate mainly to the Quadrumana, of which the Society's collection is always large, and frequently embraces doubtful specimens, only to be determined accurately after their decease. But I propose to continue my notes through the entire series of Vertebrates, devoting special attention to such species as have been described as new to science from specimens living in the Society's Gardens.

1. Macacus lasiotus, Gray, P. Z. S. 1868, p. 60, pl. vi.; Cat. of Monkeys (1870), p. 129.

The death of the typical specimen of this Macaque (which took place on the 25th May, 1870) has enabled us to decide the question whether, as Mr. Bartlett and I have always suspected, the animal had not been mutilated by the removal of its tail. There can be no longer any doubt on this point. On examination of the pelvis and vertebral column, which I now exhibit, it will be seen that the whole of the caudal appendage below the third caudal vertebra has been removed by severance through the middle of the fourth vertebra, and that the divided bone has ossified over.

It is, therefore, quite manifest that this Macaque has nothing whatever to do with the short-tailed group of *Macacus*, as its describer, who considered the want of the tail as "*evidently a natural deficiency*," has suggested, but is simply, what it looks so very much like, one of the *Rhesus* group with its tail cut off.

On comparing the skin with the specimens of *Macacus rhesus* in the British Museum, I find it different mainly in its larger size, more hairy ears, and the deep rufous terminations of the hairs of the back and flanks. In the last respect it is perhaps more like the typical specimen of *M. pelops* of the Himalayas. But if, as we believe, the so-called *M. lasiotus* was really brought from Szechuen, in inner China*, it would hardly be expected that it should be quite identical with *M. rhesus* of India. *M. lasiotus* may therefore remain in our catalogues as the designation of one of the Chinese forms of *M. rhesus*, until further opportunities occur of ascertaining whether the above-mentioned differences are constant and of sufficient importance to warrant specific rank.

It must, at the same time, be recollected that there are already two species of *Rhesus*-like Monkeys from China established—namely, *M. cyclopis*, Swinhoe†, from Formosa, and *Inuus sancti-johannis*, Swinhoe‡, from some small islands near Hong-Kong. Besides these, Mr. Swinhoe has also obtained what he considers to be a true *M. rhesus* from Hainan§. My own opinion is, that none of these supposed species, any more than *M. lasiotus*, are yet proved to be really well established as specifically distinct from *M. rhesus*.

2. MACACUS ASSAMENSIS.

By reference to the original specimen of *M. problematicus*, Gray (Cat. Monkeys, p. 128), now in the British Museum, I have ascertained that this species of Dr. Gray was founded on the Monkey deposited in our Gardens, Nov. 9th, 1868, by Major C. Richards, having been brought from Dalamcote Fort, Bhootan. In my previous note on this animal (P. Z. S. 1868, p. 566) I referred it to *M. assamensis* of M'Clelland, and I see no reason to doubt that this identification is correct. But it is of course desirable that reference should be made to the original of *M. assamensis*, which is still, as I have been informed, on application to the proper authorities for that purpose, boxed up in the cellars of the new Indian Office.

Dr. Gray (Cat. of Monkeys, p. 31) refers *M. assamensis* to a Siamese form of *M. cynomolgus*, "like *M. cynomolgus*, but pale grey, without any red shade," and with the "tail longer than the body." But this is certainly wrong, as M'Clelland says of his *M. assamensis* (P. Z. S. 1839, p. 148) "*cauda partem tertiam longitudinis totius superante*." There can, I think, be no question that M'Clelland's *Macacus assamensis* belongs to the *Rhesus* group of Macaques, as is also supposed by Jerdon (Mamm. India, p. 11), and that it is, in all probability, the same as the so-called *M. problematicus*.

Dr. Gray quotes "Assam Monkey, Bartlett, Land and Water, 1869," as a synonym of his *M. problematicus*. The point is not of great importance; but I may state that I can find no such reference in 'Land and Water,' and that Mr. Bartlett altogether denies all knowledge of ever having given it such a name.

3. MACACUS MAURUS.

The first example we received of this Monkey was purchased in August 1860, and was referred by me, in a notice of some rare Quadrumana then living in the Gardens‖, to *Macacus maurus* of F. Cuvier

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* See P. Z. S. 1868, p. 61.

† P. Z. S. 1862, p. 350, tab. 42.

‡ P. Z. S. 1866, p. 556.

§ P. Z. S. 1870, p. 226.

‖ Proc. Zool. Soc. 1860, p. 420.

(H. N. d. Mamm. pl. 45). When we received a second example in 1866 (Feb. 21), Dr. Gray described and figured it as a new species under the name *M. inornatus* (P. Z. S. 1866, p. 202, pl. xix.). But I see no reason to change my former determination. The figure in the 'Histoire Naturelle des Mammifères,' although stated to have been taken from a drawing*, agrees in nearly every respect with our specimen.

In August last Mr. W. Jamrach deposited in the Society's Gardens three Monkeys of this species, along with two of *M. ocreatus* and six of the so-called *Cynopithecus niger*. On the 1st of January of the present year we purchased two of these animals, which are still living in the Gardens.

It is unfortunate that we do not yet with certainty know the exact locality of this Macaque. But I think it is probably Borneo, as already conjectured by Dr. Gray.

This Macaque is of exactly the same form as *M. ocreatus* (figured P. Z. S. 1860, Mamm. pl. lxxxii.); and the young animals of the two species are so much alike, that one of Mr. Jamrach's specimens, supposed when it was deposited to be *M. maurus*, has since turned out to be *M. ocreatus*.

4. ATELES GRISESCENS, Gray, P. Z. S. 1865, p. 732; Cat. of Monkeys, p. 42.

Dr. Gray founded this species of *Ateles* upon a specimen that was living in our Gardens in 1864. It was brought home by Mr. E. Greey, F.Z.S. (who was at that time an officer in the West-Indian Mail Company's Steam-ship 'Shannon'), on the 29th Oct., 1864. Referring to Mr. Greey's letters, I regret to find that he did not know the exact locality of it, but only states that it was obtained by him at St. Thomas's, and had already been three years in captivity, so that it was quite adult.

In 1869 (Oct. 12) we purchased of a London dealer a somewhat similar specimen, which died twenty-six days afterwards. It was a young half-grown male. I have compared its skin (which I now exhibit) with the typical specimen of *A. grisescens*, now in the British Museum, and believe them to be probably identical. The young animal is, as might be expected, rather lighter in colour, particularly below, but above exhibits the same mixture of black and greyish hairs as in the original. The tail is nearly black above, with a light line of greyish hairs below. The length of the body is 14 inches, of the tail 16 inches. There is no rudiment of a thumb apparent.

It is possible this may be a good species, and still turn up in some part of the Central American or the Columbian coast, whence Mr. Greey's specimen probably came; but I do not yet consider it sufficiently well established.

5. ATELES CUCULLATUS. (Plate XIV.)

Ateles cucullatus, Gray, P. Z. S. 1865, p. 733; Cat. of Monkeys, p. 42; Murie, P. Z. S. 1865, p. 739.

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* Is. Geoffroy, Cat. de Mamm. p. 31.

On the 30th of June, 1865, we purchased of a dealer in Liverpool the only example I have ever met with of this very singular species—easily known from every other member of the genus I am acquainted with by the long thin hairs of the body, and in particular of the head, as described by Dr. Gray. Our specimen was an adult male.

The animal died in the August following, and Dr. Murie contributed to the 'Proceedings' some further notes on its external appearance, and an account of its anatomy. Dr. Murie has given accurate measurements of the typical specimen (which are altogether omitted in Dr. Gray's description), and also describes the colour of the face and adjoining parts, but has omitted to note that there is a small tubercle representing the thumb in this species.

The accompanying drawing (Plate XIV.), which may serve to render this Spider Monkey more easily recognizable, has been taken by Mr. Smit from the typical specimen, which is now in the British Museum.

It is much to be regretted that we do not know the true *patria* of this *Ateles*; but I have some reason to suppose it may be from the northern coast of Columbia, as I am told that a black Spider Monkey with long hair over its head is occasionally brought for sale into Cartagena.

6. ATELES VARIEGATUS, Wagner.

In July last we received from the Hon. A. Gordon a young female Spider Monkey, which I was at first inclined to refer to *A. belzebuth* of Geoffroy*, but which having died, and having been acquired by the British Museum, was described by Dr. Gray as the female of his *A. bartletti*†.

In my remarks on this specimen (P. Z. S. 1870, p. 668, and Ann. N. H. ser. 4, vol. vi. p. 472) I have given my seasons for considering *A. bartletti*, Gray, to be a synonym of *A. variegatus*, Wagner.

In his reply to my remarks (Ann. N. H. ser. 4, vol. vi. p. 18) Dr. Gray says that he does "not think I have proved my case." In order to do this, therefore, more completely, I accepted the kind offer of Herr. v. Pelzeln to send me one of the typical specimens of *A. variegatus* in exchange from the Imperial Cabinet of Vienna, and thus convinced myself and other persons interested in the question that my views were correct‡.

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* *Cf.* P. Z. S. 1870, p. 668.

† Ann. Nat. Hist. ser. 4, vol. vi. p. 428.

‡ See *anteà*, p. 39. As regards some remarks of Dr. Gray (Ann. Nat. Hist. Feb. 1871) on the notice of the exhibition of this specimen as given in our printed minutes, I may be permitted to observe:—(1) What I exhibited was not *the* typical specimen of *A. variegatus*, but *a* typical specimen, *i. e.* one of Natterer's original examples, of which he altogether obtained five. (2) This was *received by me in exchange* from the Imperial Cabinet of Vienna, not *loaned to me* by the Museum of Munich, as Dr. Gray assumes, *l. c.* p. 164. (3) The name *variegatus* was not published only in a "miserable compilation," as Dr. Gray calls Reichenbach's work (Ann. Nat. Hist. Jan. 1871, p. 18), but, as shown by the synonyms given below, in the 'Transactions' of the Bavarian Academy of Sciences and in other well-known works.

I have now taken the typical specimen of *A. variegatus* to the British Museum, and compared it with the type of *A. bartletti* and with the specimen obtained from Mr. Gordon. The conclusion I have arrived at is that all three specimens are referable to one species. As to the two first there can, I think, be no doubt whatever, as they agree in every particular except in the smaller size and fainter tinge of the colour below in the Nattererian specimen, which is just what we should expect to find in the female. Mr. Gordon's example is still paler below, and shows no signs of the white stripe on the sides of the face. But there is a slight indication of the frontal spot, and the character of the hair on the head agrees completely with that of the other two specimens.

On the whole, therefore, I believe that Dr. Gray was correct in referring Mr. Gordon's specimen to his *A. bartletti* (i. e. *A. variegatus*).

In a recent article on the Mammals of Costa Rica*, Dr. A. von Frantzius states that a number of skins of an *Ateles*, collected by him in Costa Rica and sent to the Berlin Museum, were determined by Dr. Peters to be *A. variegatus*. This appeared to me to be such an extraordinary locality for the present species that I wrote to Dr. Peters to inquire on the subject. Dr. Peters informed me that Dr. v. Frantzius had made a mistake, and that the only skins of *Ateles* received from Costa Rica by the Berlin Museum were, in his opinion, referable to *A. frontatus* (Gray), i. e. *A. melanochir* †.

Dr. Slack, in his article on the prehensile-tailed Quadrumana‡, has likewise confounded *Ateles variegatus* with *A. melanochir*, describing *A. variegatus* as the male, and *A. melanochir* as the female of the same species! But the plate in Reichenbach's Atlas (Nat. d. Affen, pl. x. fig. 154), which is referred by Dr. Slack and Dr. Gray to *A. melanochir*, although not very good, as well as the description (p. 62), are both clearly intended for *A. variegatus*; indeed Reichenbach tells us that they were taken from the typical specimens of that species in the Vienna Museum.

The synonyms of *Ateles variegatus* will therefore stand as follows:—

ATELES VARIEGATUS.

Ateles variegatus, Wagner, Säugeth. i. p. 313 (1840); *ej.* Abh. Acad. Münch. v. p. 420 (1847); *ej.* Säugeth. v. p. 78 (1855); Reichenbach, Affen, p. 62, pl. x. fig. 154; Sclater, Ann. Nat. Hist. ser. 4, vol. vi. p. 472; *ej.* P. Z. S. 1870, p. 668, 1871, p. 39.

Sapajou geoffroii ♂, Slack, Proc. Ac. Sc. Phil. 1862, p. 511.

Ateles bartletti, Gray, P. Z. S. 1867, p. 992, pl. xlvii. (♂); *ej.* Ann. Nat. Hist. ser. 4, vol. vi. p. 428 (♀ jr.).

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* Arch. f. Nat. 1869, pt. 1, p. 257.

† Dr. v. Frantzius must likewise have made some strange mistake when he speaks of an *Eriodes frontatus*, Gray, from Costa Rica (*l. s. c.* p. 258). The genus *Eriodes* is, I believe, restricted to the wood-region of S.E. Brazil; and *Brachyteles frontatus*, Gray, is certainly a true *Ateles*.

‡ Proc. Acad. Sc. Phil. 1862, p. 511.

Diagn.—A. *corporis pilis elongatis et mollibus; capillitio frontali antrorsum projecto, tripartito: supra ater; macula frontis ferruginea, facie nigra pilis albis utrinque limbata: gastræo, artuum latere interno, tibiis antebrachiisque extus et cauda subtus ferrugineo-ochraceis: long. corp.* 24, *caudæ* 29 *poll. Angl.* Fœm. *mari similis, sed minor et colore subtus fulvescente griseo.*

Hab. Eastern Peru, near Chyavetos (*Bartlett*); Upper Rio Negro, Serra de Cocoi (*Natterer*); Upper Caura river, Venezuela (*Gordon*).

7. Ateles melanochir. (Plate XV.)

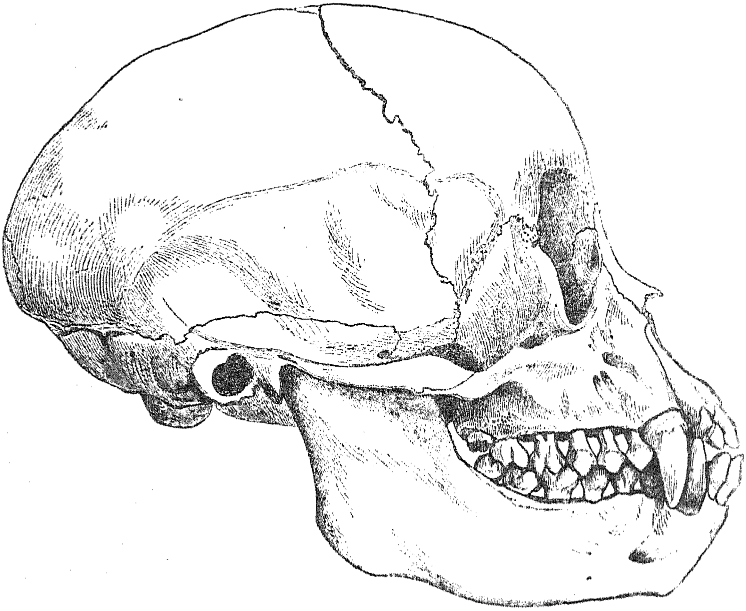
Ateles melanochir, Desm. Mamm. p. 76.

Ateles geoffroii, Kuhl, Beitr. p. 26.

Atèle melanochéir, F. Cuv. Mamm. vol. i. pl. 66.

Ateles melanochir et *A. ornatus*, Gray, Cat. Monkeys (1870), pp. 43, 44.

Fig. 1.



Skull of *Ateles melanochir* (natural size).

I have already spoken (P. Z. S. 1870, p. 797) of the fact of our having received from Nicaragua a second example of Dr. Gray's *A. ornatus*, which has since been described in his new catalogue of Monkeys. Although, now that I have had the opportunity of examining this animal, I have little doubt that it is merely a variety of

A. melanochir, of which, as stated above, an example arrived in company with it, I think it desirable to give a figure of it. We are now well acquainted with the true *patria* of this form, as the present example was purchased of one of the officers of the R. W. I. Mail Co., who brought it from Greytown, Nicaragua.

Upon referring to the specimen in the British Museum upon which *A. ornatus* was established, I find that that was also received from this Society in 1850.

The specimen of this *Ateles* which we received on October 14th, 1870, died November 13th; and I now exhibit its stuffed skin and skull. It was a male, not adult, the last upper molars just coming up (see fig. 1, p. 226). There are no traces of a rudimentary thumb. The hair of the forehead is reflexed, meeting that of the crown about an inch above the eyes. The hands and feet and the end of the tail above are black, the black extending over the outsides of the thighs, and somewhat also over the shoulders; the lower back above flanks and belly are rusty red, which colour extends over the back of the thighs and base of the tail below, and renders the species easily recognizable, as far as colour goes.

The whole length of body is 17 inches, of tail 21 inches.

This specimen has been sold to the Trustees of the British Museum.

8. CEBUS LUNATUS.

Cebus lunatus, F. Cuv. Hist. Nat. d. Mamm. pl. 70.

Cebus leucogenys, Gray, P. Z. S. 1865, p. 824, pl. xlv.; Cat. of Monkeys, p. 48.

This species was established by Dr. Gray upon a *Cebus* which was living in our Gardens in 1861. About this specimen, I regret to say, I can discover no particulars, as it was never discriminated from several other Capuchin Monkeys which were in the Society's Gardens at the same period.

As far as I can tell from Dr. Gray's figure and very short description, this *Cebus* does not differ materially from the *Sajou cornu, mâle*, of F. Cuvier, Mamm. pl. 70 (*Cebus lunatus* of the table of plates), which is usually regarded as the adult of *Cebus apella* sive *fatuellus* *. If really different, *lunatus* would, in my opinion, be a prior name for it.

9. PITHECIA LEUCOCEPHALA.

I have already (P. Z. S. 1866, p. 305) stated the circumstances under which the only example of this Saki which I have ever seen alive came into our possession. It died on the 26th of June, 1865, and was purchased by the British Museum.

In Dr. Gray's Catalogue of Monkeys, with this species is united *P. chrysocephala* of I. Geoffroy St.-Hilaire, of which *P. leucocephala* is regarded as the female. But our *P. leucocephala* was an adult male, as determined by Dr. Murie. Moreover, from the examination of a large series of specimens of this Saki obtained by Natterer on the Rio Negro and Rio Brancho, Wagner has shown that *P. rufiventer*, Geoffr. (Gray Cat. Monkeys, p. 60), is really the female of *P. leucocephala* *.

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* *Cf.* Burmeister, Abh. Ak. Halle, 1854, p. 92, and Wagner, Säugeth. v. p. 84.

My own opinion is that Wagner, although somewhat prone to unite species, can hardly have been mistaken on this point. I am therefore inclined to regard it as possible that *P. chrysocephala* may be the male of a closely allied but distinct species, probably occupying a different geographical district. It seems to differ from *P. leucocephala* not only in its yellow head, but in the narrow black line which parts the middle of the forehead. The specimen in the British Museum was purchased at Stevens's sale-rooms in 1842, and was said to have been received from the "Rio Negro."

10. PITHECIA SATANAS.

In March 1864 we purchased a young female American Monkey from a London dealer, along with a lot of other animals received, I believe, from Pará. I was inclined to think it might be the young of *Pithecia satanas* (Hoffm.), and gave notices of it in the Society's 'Proceedings' under that name (1864, pp. 138, 712), and a figure (plate xli.). The specimen died, and is now in the British Museum.

On the 30th of March 1868, we purchased of another dealer a second young example of the same Monkey, which I also recorded as *P. satanas* (?). This animal died November 14th of the same year, and is likewise now in the British Museum.

Upon these two examples Dr. Gray has established a new species, his *Chiropotes ater*, Cat. Monkeys (1870), p. 61.

I have recently reexamined these specimens in the British Museum, and, after comparison of them with the other specimens in that collection, have found no reason to alter my determination. The condition of the skulls shows that the animals were both quite immature.

There seem to be two nearly allied species of this form of *Pithecia*:—

(1) PITHECIA CHIROPOTES (Humb.).

Simia chiropotes, Humb. Obs. Zool. i. p. 312.
Simia sagulata, Traill.
Brachyurus israëlita, Spix.
Pithecia chiropotes, Geoffr. et auctt.

Diagn.—*Major: nigra: dorso castaneo: barba maris adulti incrassata maxima.*

Hab. Upper Orinoco (*Humb.*); Rio Negro (*Spix*); British Guiana (*Schomb.*); Rio Brancho (*Natt.*).

(2) PITHECIA SATANAS (Hoffm.).

Simia satanas, Hoffm.; Humb. Obs. Zool. i. p. 315, tab. xxvii.
Chiropotes couxio, Less.

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* *Cf.* Wagner, Abh. Ak. Münch. v. p. 436, et Säugeth. v. p. 97.

Pithecia satanas, Geoffr. et auctt.
Saki noir, F. Cuv. Hist. des Mamm. pl. 78.

Diagn.—*Minor: nigra: dorso interdum fusco lavato: barba minus crassa.*

Hab. Lower Amazon, near Pará (*Hoffm.* et *Natt.*); British Guiana (*Schomb.*)

Wagner (Abh. Ak. München, v. p. 433, and Säugeth. v. p. 102) proposes to unite these two species, as being mere varieties. Dr. Gray, on the other hand, has made *three* species out of them. But, even if the latter view be adopted, our two specimens above mentioned must be referred to the true *P. satanas* (Hoffm.), which is the black form from Pará.

Of *P. chiropotes* we have within the last ten years likewise acquired two living specimens. Both were purchased of Mr. E. Greey (one on the 18th of November, 1865, and the other on the 15th October, 1866), and were, I believe, from Guiana. The latter is noticed P. Z. S. 1866, p 418, as *P. satanas*, as I was not then convinced of the specific difference of the two forms.

The plate 78 of the 'Hist. Nat. des Mammifères' (*Saki noir*) undoubtedly represents Dr. Gray's *Chiripotes ater*, or, as I consider it, the young of *P. satanas*. M. F. Cuvier in his letterpress refers the plate to *P. satanas*, but observes upon the absence of the beard figured in Humboldt's plate; but this is no doubt due to the youth of the specimens. Both our living examples were quite young, as is evidenced by their skulls, which are now in the British Museum.

11. HAPALE CHRYSOLEUCOS.

I have already shown that *Mico sericeus* (Gray, P. Z. S. 1868, p. 256, tab. 24), founded on an animal living in our Gardens in 1868, is the *Hapale chrysoleucos* of Wagner (P. Z. S. 1868, p. 592). Dr. Gray, however, has more recently made it the type of a new genus, *Micoella*, and has arranged *H. chrysoleucos* in this new genus as a second species (see Cat. Monkeys, p. 131). Dr. Gray gives the *habitat* of his *Micoella sericeus*, as "Brazil (*Natterer*)," whereas the only specimen of this species in the British Museum is that which was living in our Gardens in 1868, long after Natterer's decease.

12. LEMUR MACACO.

Male.

The black Maucauco, Edwards, Gleanings, v. p. 217.
Lemur macaco, Linn. S. N. i. p. 44.
Lemur niger, Geoffr. Ann. d. Mus. xix. p. 159; Peters, Reise n. Mozamb. i. p. 21.
Varecia nigra, Gray, P. Z. S. 1863, p. 136.
Lemur macaco, var β, Van der Hoeven, Tijdschr. xi. p. 32.

Female.

Lemur leucomystax, Bartl. P. Z. S. 1862, p. 347, pl. xli.
Varecia leucomystax, Gray, P. Z. S. 1863, p. 136.

Male and Female.

Lemur macaco, Schlegel, Ned. Tijdsch. iii. p. 67; Schl. et Poll. Faune de Mad. p. 1, pl. i.

Lemur niger, Sclater, P. Z. S. 1866, p. 1; Cat. of Vert. ed. iv. p. 12.

In his new Catalogue of Monkeys, Dr. Gray has reunited this species, of which both sexes are now well known to us, to the *Lemur varius* of Geoffroy, as Wagner (Säugeth. v. p. 142) and others have done before him. But there can be no doubt that, as already pointed out by Professor Schlegel *, the two species are quite distinct. Besides the differences noted by Professor Schlegel, the voice of *Lemur varius* is very loud, harsh, and powerful. Mr. Bartlett tells me he has heard it at least a mile off. But *Lemur macaco* has only a coarse grunting call-note, similar to that of most of the smaller *Lemures*. Within these last ten years we have had two of the former and four of the latter alive in the Gardens, and thus have had ample opportunities of observing them. Besides, as our last specimen of *Lemur varius* was a female, we know that in this species the sexes are nearly alike. In *Lemur macaco* (sive *niger*) they are quite different.

13. LEMUR MONGOZ. (Plate XVI.)

Just as was the case with the last-named species, I believe that, with Mr. Bartlett's excellent assistance, I have discovered, by observation of the living animals, that two Lemurs heretofore regarded as quite distinct are really male and female of the same species, to which the earliest name applicable appears to be *Lemur mongoz* of Linnæus, founded on the "Mongooz" of Edwards (Gleanings, i. p. 12, t. 216). The females of this Lemur have been hitherto called in our Gardens Black-fronted Lemurs (*Lemur nigrifrons*), being, as I believe, the *Lemur nigrifrons* of Geoffroy (Ann. d. Mus. xix. p. 169), but not of F. Cuvier (Mamm. pl. 92 †). The males have been called the Yellow-cheeked Lemur (*Lemur xanthomystax*), but, no doubt, incorrectly, for the Lemur described and figured under that name by Dr. Gray (P. Z. S. 1863, p. 138, pl. xviii.) seems to be different. But the female is certainly the animal figured by F. Cuvier (Mamm. pl. 93) as "*Le Maki à gorge blanche, femelle—Lemur dubius.*"

All the "Yellow-cheeked Lemurs" we have had in the Gardens have, as far as I can ascertain, been males, and all the "Black-fronted" females. On May 29th, 1857, we purchased a Black-fronted Lemur. This bred in 1865 with a male "Yellow-cheeked" Lemur, and produced a young one—a male, like its male parent. This was supposed at the time to be a hybrid, and was registered* as such in our books; but I have now little doubt that it was purely bred. It died in 1868.

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* "Ce Lémur présente, et plus particulièrement par les longs poils garnissant les oreilles, de l'affinité avec *Lemur varius*, Geoffroy—espèce que les naturalistes, successeurs de Linné, ont l'habitude de désigner sous l'épithète de *L. macaco*. Mais ce véritable *macaco* s'éloigne constamment du *L. varius* par sa gorge velue, un système de coloration assez différent, une taille moins forte et un pelage beaucoup moins fourni, moins touffu, et moins laineux." (Schlegel, Ned. Tijdschr. iii. p. 78.)

† *Cf.* Van der Hoeven, Tijdsch. xi. p. 35.

In 1867 (July 17th), Mr. Bartlett bought for the Society four Lemurs, two Black-fronted and two Yellow-cheeked, which are all four still living in the Monkey-house. The former are females, and the latter males, and they always go together in pairs, and are considered by the keepers to be males and females of the same species.

I exhibit a drawing, prepared by Mr. Smit, of one of these pairs, and propose to rearrange the synonyms of the two sexes under the first-given name of *Lemur mongoz*, as follows:—

LEMUR MONGOZ. (Plate XVI. fig. 1 ♀, fig. 2 ♂.)

Male.

Lemur mongoz, Van der Hoeven, Tijdschr. xi. p. 34.

Lemur collaris, Geoffr. Ann. d. Mus. xix. p. 161; Wagner, Säugeth. v. p. 143; Is. Geoffr. Cat. de Mamm. p. 72.

Female.

The Mongooz, Edwards, Glean. v. p. 12, t. 216.

Lemur mongoz, Linn. S. N. p. 44; Fischer, Syn. Mamm. p. 75.

Lemur nigrifrons, Geoffr. Ann. d. M. xix. p. 160; Fischer, ibid. p. 77; Van der Hoeven, Tijdschr. xi. p. 35 Bennett, Gard. & Men. Z. S. i. p. 301.

Lemur dubius, F. Cuv. Mamm. pl. 93 (fig. exact).

Lemur mongoz, var. β, Wagner, Säugeth. v. p. 144.

Diagn.—♂ *griseo-brunneus: genis et collari flavescentibus.* ♀ *rufo-grisea, nucha humerisque canis: gula alba: fascia frontali nigra: facie albicante.*

It may be remarked in favour of this view that both the specimens of *Lemur collaris* in the Paris Museum are marked *males*, that F. Cuvier expressly states that his *Lemur dubius* is a female, and that Mr. Bennett (Gard. & Men. *l. s. c.*) states that both the Black-fronted Lemurs in the Society's Gardens in 1831 were females†. But after all I only submit this view as an hypothesis to be confirmed by subsequent investigation.

14. LEMUR BRUNNEUS, V. d. Hoeven.

Dr. Gray's type of *Prosimia melanocephala* (P. Z. S. 1863, p. 137, pl. 138) was received from the Society's collection in December 1855.

We have now in the Gardens a *female* Lemur, purchased July 23rd last, which appears to be of the same species.

I may add that I am inclined to think it will turn out to be the same as the *Maki à front noir*, *Lemur nigrifrons*, of F. Cuvier (Mamm. pl. 92), but not of Geoffroy, which Van der Hoeven has called *Lemur brunneus*. Van der Hoeven's description (Tijdschr. v. N. G. xi. p. 35) seems quite applicable to it. I am therefore disposed to consider *Prosimia melanocephala*=*Lemur brunneus*.

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* See P. Z. S. 1865, p. 860, and List of Vert. ed. iv. p. 13.

† Since these notes were read, I have examined the specimens of this Lemur in the gallery of the British Museum, and find the males marked *Lemur collaris* and the females *Lemur nigrifrons*.

15. LEMUR FLAVIFRONS.

This species was established by Dr. Gray in 1867 (P. Z. S. 1867, p. 596, pl. xxxi.), under the name *Prosimia flavifrons*, upon a Lemur then living in the Society's Gardens. It was purchased May 11, 1867, of a London dealer, and died Sept. 30th of the same year. It is now in the British Museum. Dr. Gray speaks of this animal as a *male*; but in our Prosector's books it is registered as an *adult female*.

We have now a second similar specimen in the Gardens, presented by Major R. Lloyd, June 12, 1868. This is certainly a *female*.

16. MELLIVORA LEUCONOTA, Sclater, P. Z. S. 1867, p. 98, pl. viii.

The specimen which I described provisionally under this name is still living in the Society's Gardens. It is now quite adult; and the lower back has become more greyish, while the crown remains of a nearly pure white. It could now hardly be distinguished from *M. indica*.

There being, I believe, no doubt of the African origin of this specimen, I am led to the conclusion that there is not really more than one valid species of this genus after all, which, like other Carnivora, extends from the Cape into the Indian peninsula.

Heuglin (Syst. Ueb. d. Säugeth. Nordost-Afr. in Sitz. Ak. Wien, liv. p. 563) notices *Mellivora* as met with in Southern Nubia, Cordofan, Eastern Sennaar, and Central Abyssinia, but refers the species to *M. capensis*.

17. URSUS NASUTUS, Sclater, P. Z. S. 1868, p. 73, pl. viii.

The bear which I provisionally described under this name, and which was stated to have been brought from the "West Indies," has recently died. It was in rather a diseased state, I regret to say, and neither skin nor bones were in a satisfactory condition.

However, I had the head carefully macerated, and have submitted the skull to the examination of Mr. Busk, our best authority on such subjects. Mr. Busk kindly informs me that he cannot detect any difference, as regards either skull or teeth, between it and *Ursus americanus*, of which he is inclined to consider it a mere variety.

Under these circumstances, I have placed this specimen in the new edition of the Catalogne of Vertebrates under *Ursus americanus*. I should also remark that I now find that a similar variation in the colour of a specimen of *Ursus americanus* has been already noticed in an individual living in the Menagerie at Chantilly, upon which Geoffroy founded his *Ursus gularis* (*cf.* F. Cuv. Mamm. sub tab. 217).

We have also now living in the Gardens a Black American Bear which presents faint traces of white on the chest.

18. HYSTRIX CRISTATA, Linn.

We have had in the Gardens of late years a considerable number of Porcupines of the group allied to *Hystrix cristata*, from Western and Southern Africa and from India. I have hitherto referred the Western-African specimens to *H. cristata*, the Southern-African to *H. africæ australis*, Peters, and the Indian specimens to *H. leucura*, Sykes. At the same time, I must observe that the task of distinguishing these species by external characters is by no means an easy one, and that, in the event of the animals getting together, it would not be always very easy to recognize them again.

At the present time we have in the Gardens two Porcupines from India, and one from Ceylon, which we refer to *H. leucura*. The two Indian specimens (both presented by Colonel Thomson, Aug. 25, 1865) * have very little white on the point of the crest, a line of white spines down the centre of the lower back, and the long quills of the back with long white terminations. These are just the characters attributed to the Indian Porcupine (*Hystrix leucura* sive *hirsutirostris*) by Mr. Waterhouse in his excellent 'History of Mammalia' (vol. ii. p. 454). The Ceylonese specimen (presented by Mr. Oswald Brodie in 1864) is very nearly similar, but has no white at all, or next to none, on the crest.

Of African Porcupines of the *H. cristata* group we have now two living examples. In one, said to be from West Africa (purchased May 1869), the crest is broadly ended with white, there is no mesial line of white spines on the back, and the white ends of the long quills of the back are much shorter, so that the quills are generally altogether blacker.

The second, presented by the Duke of Edinburgh in November 1860, and said to have been brought from the Cape Colony, generally resembles the West-African specimen, but is larger, and has a *white mesial line* of spines on the back, as in *H. leucura*. It has the crest broadly tipped with white as in the West-African specimen. This I suppose to be *Hystrix africæ-australis* of Peters (Reise n. Mos. Mamm. p. 170). At the same time I must confess that I am not very well satisfied with these determinations.

I do not intend for a moment to deny that the three species mentioned above may not be separated by external characters, as well as by their well-known cranial differences; but living Porcupines are not easy animals to examine, and in the many inspections I have made of our specimens I have not been able to make out any more positive characters by which to distinguish them.

In 1865, I described and figured in the Society's 'Proceedings' (p. 352, pl. xvi.), under a name previously given by Mr. Day, some examples of the "Orange-quilled Porcupine" of Malabar, which had then been recently received from Col. Sir W. T. Dennison. In my description of this supposed species I pointed out that, as regards its cranial characters, it agreed with *H. leucura* in the shape of the nasal and intermaxillary bones, but that there were some other minor differences which might be sufficient to confirm the species.

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* According to their labels. But this pair bred in 1866; and when the young pair were sold, Mr. Bartlett suspects that *one* of the old pair was sent away in error instead of one of the younger pair.

After being some time in the Gardens, our Orange-quilled Porcupines gradually lost the splendid orange-colour in their quills and became undistinguishable in external appearance from other Indian specimens. Under these circumstances, I cannot doubt that the colour of the quills is merely due to some local variation, probably to some particular food which they consume; and I have therefore reduced *Hystrix malabarica* to a synonym with *H. leucura* *.

19. HYSTRIX LONGICAUDA, Marsden.

Under the name *Acanthochœrus*† *grotei* Dr. Gray described and figured in 1866 (P. Z. S. p. 306, pl. xxi.) a Porcupine then lately received by the Society from Mr. Arthur Grote, F.Z.S. Dr. Gray gives the locality of this animal as "India;" but upon application to the donor I ascertained that it had really been received from Malacca, having been procured for Mr. Grote from the jungles of that settlement by Capt. Maddison, of one of the Straits Mail Steamers‡.

In 1868 (July 20) Mr. Grote presented us with a second specimen of the same Porcupine, obtained from the same locality as the former one. This, as well as the former, is still alive and doing well in the Society's Gardens.

In such a difficult group as the Porcupines it is prudent to examine specimens perfectly before making many remarks on them. I shall therefore, for the present, merely state that I consider the so-called *Acanthochœrus grotei* to be the same as the Porcupine figured in Marsden's 'Sumatra' (pl. 13. p. 118) as *Hystrix longicauda*, and that it has other synonyms. The animals of the settlement of Malacca are well known to be mostly the same as those of Sumatra, so that it would be *primâ facie* probable that the Porcupines of the two countries would be identical. I am aware that *Hystrix longicauda* is considered by Blyth and Jerdon (Ind. Mamm. p. 221) to be the same as *Hystrix hodgsoni* of

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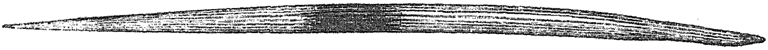
* Dr. Jerdon (Mamm. of India, p. 218) follows Mr. Blyth in dividing the Crested Porcupines of India into two species, *H. leucura* and *H. bengalensis*, and refers *H. malabarica* to the latter, from information received from Mr. Blyth.

† As regards the genus *Acanthochœrus*, it is sufficient to observe that the typical species of this genus (*A. bartletti*, Gray, P. Z. S. 1866, p. 310) is based upon a hybrid Porcupine bred in the Surrey Zoological Gardens between *H. javanica* and *H. cristata*. Dr. Gray had previously founded his *Acanthion fleming ii* (P. Z. S. 1847, p. 103) upon another hybrid bred by the same pair of Porcupines. In his last paper on Porcupines (P. Z. S. 1861, p. 307), Dr. Gray states that he "thinks it probable" that there may have been some mistake in the account of the hybridism of these Porcupines which is most circumstantially given by Mr. Waterhouse, Hist. Mamm. ii. p. 307; but on referring to Mr. Bartlett, from whom Mr. Waterhouse derived his information, Mr. Bartlett assures me that at the period when he made the inquiries he was assisting Mr. Waterhouse in his work on the Rodents, and that he has no doubt whatever that the information he supplied was correct. It is important that this should be stated in order to save great trouble and perplexity to future workers on the Porcupines.

‡ See P. Z. S. 1866, p. 417.

Nepal and *H. javanica* of Java. I believe, however, that this is quite a mistake. The two latter species are certainly very closely allied; but I have no reason to doubt Mr. Waterhouse's determination that they are different. But *H. longicauda* is apparently quite distinct from either of them, having a slightly elevated crest and being black and white instead of brown and yellow. The Sumatran black and white specimen in the Leyden Museum spoken of by Mr. Waterhouse (*l. c.* p. 46) is probably *H. longicauda.*

Fig. 2.



Shed spine of *Hystrix longicauda* (one-half the natural size).

I exhibit some shed spines of our *Hystrix longicauda*, which, it will be observed, are at once distinguishable from those of the *H. cristata* group by being white, with only one nearly central black ring. It will be noticed that in Marsden's figure of *H. longicauda* some few of the spines are doubly barred with black; but this is, no doubt, attributable to artistic error.

I hope to be able to give further particulars concerning *Hystrix longicauda* whenever either of our specimens dies*.

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* Since this was written, Mr. W. Marshall has kindly supplied me with the following note on the Porcupines of this form in the Leyden Museum:—

"In the Leyden Museum are examples of two species or races of *Hystrix* from the Southern Asiatic archipelago,—that is, *H. javanica*, and a *Hystrix*-form from Sumatra, under the Museum name *H. mülleri*, which is unquestionably the same as that which you call *H. longicauda*. S. Müller (Verh. Nat. Geschied. p. 36) has already spoken of the differences between these two races, of which one comes from Java, the other from Sumatra. In our Gallery here we have of *H. javanica* three stuffed examples, two skeletons, and three skulls; of *H. longicauda* (under the MS. name *H. mülleri*, Temm.) we have one full-grown example from Sumatra, and a very young one in its first year from Borneo. A half-grown individual, which is marked *H. javanica*, without any locality, is certainly referable to *H. longicauda*. What v. d. Hoeven intended by *H. ecaudata* is not clear to me; and his *H. torquata* is simply a synonym of *H. javanica*. The following table gives a comparison of the principal differences between the two allied species:—

	H. javanica.	*H. longicauda.*
Length of longest spines in back ...	120^{mm}	$160\text{–}170^{\mathrm{mm}}$
Length of spines in the tail	52	69
Length of spines in upper back ...	32	53
Length of spines on the head	35	57
Colour of extremities of head-spines	Dark brown.	Dark greyish black.
Colour of spines on back	Yellowish orange, with a dark brown band.	White, with a dark brown band.
Cervical band..........................	Yellowish, well developed.	White, subobsolete.

"In the skeleton and skull I can find no material differences between the

20. ATHERURA FASCICULATA (Shaw); Waterhouse, Mamm. ii. p. 470.

On the 18th of September, 1867, we obtained, by purchase, of the Jardin d'Acclimatation of Paris, a single specimen of this species, said to have been received from Saigon. On the 14th of March last Dr. Jerdon brought home with him an example of the same species from Cherra Punji on the Khasya hills, and presented it to the Society. This specimen is now living in the "Small-Mammal House," in company with two of its African allies (*A. africana*), and serves to prove how very closely these two species resemble each other externally.

They are very nearly of the same size and form, and much alike in general appearance. But *A. fasciculata* has the long spines of the back terminated with white, and is generally brighter in colour. Likewise the spines on the flanks and lower belly round the anus are tipped with white. In *A. africana* they are black, but whitish at their bases.

21. PHACOCHŒRUS ÆLIANI.

Phacochœrus sclateri of Dr. Gray (Ann. Nat. Hist. ser. 4. vol. vi. p. 190) was founded upon the female Ælian's Wart-hog (*Phacochœrus æliani*) now living in the Society's Gardens, apparently because the drawing of the head of this animal given in my notice of its arrival (P. Z. S. 1869, p. 276) does not quite agree with Rüppell's figure in his 'Zoological Atlas,' tab. 25. Dr. Gray became subsequently of opinion that this specimen might even be a *Sus* (*op. cit.* p. 263). I replied to these remarks in a subsequent number of the 'Annals' (vol. vi. p. 404), and only now refer to them in order to introduce a few additional remarks upon the distinctness of the two known species of *Phacochœrus*.

The skeletons of the pair of *P. æthiopicus* that were purchased by the Society in 1850*, and lived so long in our gardens†, are now in the British Museum. On examining them I find no traces of upper incisors in either skull, but in both of them the lower jaws present alveoli of the two deciduous lower incisors.

I have likewise, with Mr. Bartlett's assistance, examined the mouths of the fine adult pair of *P. æthiopicus* now living in the Society's Gardens (presented by the Duke of Edinburgh in May 1866), and have found no perceptible traces of incisors either above or below.

In the spring of this year one of our correspondents deposited in the Society's Gardens four young examples of the same species. I

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two species. The tail in *H. longicauda* is not longer; but the transverse processes are rather broader."

There can be no longer any doubt, therefore, that we have here a repetition of the frequent case of an animal found in Malacca, Sumatra, and Borneo, but replaced in Java by a distinct form.

* See P. Z. S. 1850, p. 78, pl. xvii.

† The male died June 22, 1862, the female December 16, 1859.

had all these caught, and examined their mouths, but could find no trace of incisors either above or below.

Of *P. æliani*, the adult female above spoken of, now in the Society's Gardens, has two well-formed incisors above and six below, just as the skull of the specimen obtained by Mr. Blanford in Abyssinia[*], which is now in the British Museum.

In November last Mr. Jamrach had on sale four Ælian's Wart-hogs; and I sent Mr. C. Bartlett down to examine them, hoping to find a mate for our husbandless female. Mr. Bartlett reported to me that they were unfortunately all of the female sex; but having at my request taken the opportunity of examining their mouths, he found that all these four animals also had "two incisors in the upper jaw and six in the lower."

It appears, therefore, that in every specimen examined (eight of *P. æthiopicus* and five of *P. æliani*), the differences of dentition usually held to separate these two species correspond with the external characters, and that *P. æthiopicus* (usually so called) has no incisors above and two small deciduous incisors below, whereas *P. æliani* has two permanent incisors above and six below.

As regards the distribution of these two species, Wagner appears to be quite correct when he comes to the conclusion that *P. æthiopicus* is confined to the extreme south of Africa[†]. Our two pairs were both received from Natal. But *P. æliani* seems to be spread all over the continent, being met with in Abyssinia and East Africa generally (*Rüppell*), Cap Verd (*Buffon*), Ashantee (Viv. Soc. Zool. Lond.), Guinea coast (*Pel*), Caffraria (*Wahlberg*), and Mozambique (*Peters*).

I may add that there can be little doubt that *P. æliani* ought, according to the strict laws of priority, to be called *P. africanus*, being the *Sus africanus* of Gmelin (S. N. p. 220), based upon Buffon's "*Sanglier du Cap Verd.*"

22. CERVUS PSEUDAXIS, Eyd. & Soul.

Hitherto I have called the Formosan Deer *Cervus taëvanus* (emended from *taiouanus*, Blyth). But as Mr. Swinhoe has now examined the typical specimens of *Cervus pseudaxis* in the Museum of the Jardin des Plantes, and convinced himself that they belong to the Formosan species[‡] (as I have suggested would probably turn out to be the case, in my article on the Deer living in the Society's Gardens[§]), I think it right to revert to the earlier name, and have accordingly entered this species in the new edition of the List of Vertebrates as *Cervus pseudaxis*.

23. CERVUS ALFREDI, Sclater, P. Z. S. 1870, p. 381, pl. xxviii.

The fine male Deer to which I have recently given the name of *Cervus alfredi* is still living in good health in the Society's Gardens.

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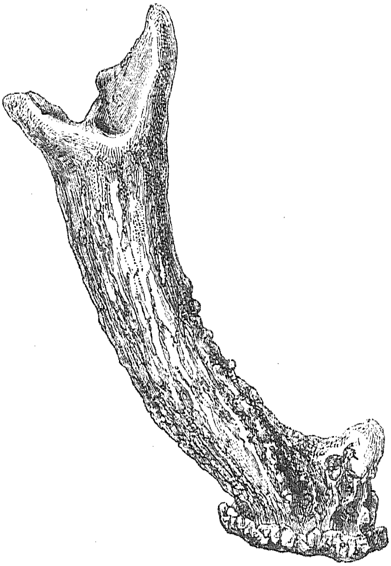
[*] *Cf.* Blanford, 'Geology and Zoology of Abyssinia,' p. 242.
[†] Säugeth. Suppl. v. p. 511.
[‡] P. Z. S. 1870, p. 646.
[§] Trans. Zool. Soc. vii. p. 345.

Its appearance did not alter during the winter; and it is quite evident that, like the Axis, this species has no winter coat, but retains the same dress all the year round.

On the 13th of November last this animal shed his antlers, which I now exhibit. It will be seen that they are of a very simple character, consisting of a short stout beam, which throws off an anterior snag about an inch and a half above the base, and then, slightly curving backwards and then forwards, separates into two small branches. Their total length is about six inches.

Fig. 3.



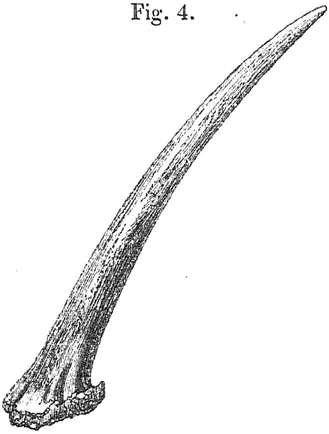
Cast antler of *Cervus alfredi* (half the natural size).

The new pair of antlers, now just grown, are hardly longer, and very similar in form, the snags, which are worn down in the present pair, being rather more developed. It would appear, therefore, that the animal is nearly adult; but whether this be so or not, it is quite evident that *Cervus alfredi* differs materially from *Cervus axis*, in which, even in the second year, the antlers attain a very much greater length of beam.

24. CERVUS PUDU (Mol.). (Plate XVII.)

The male *Cervus pudu*, of which I gave a notice in the Society's 'Proceedings' for 1864 (p. 105), is still living in the Society's Gardens, and annually developes a diminutive pair of antlers. I exhibit those shed in 1869 and 1870, which are probably the

Fig. 4.



Cast antler of *Cervus pudu* (natural size).

Fig. 5.

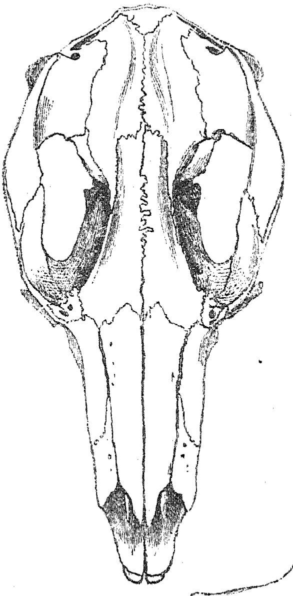


Fig. 6.

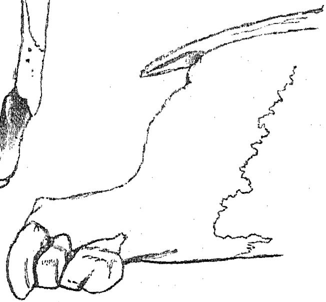


Fig. 5. Upper surface of skull of *Halmaturus erubescens* (half the natural size).
6. Lateral view of incisors of ditto (natural size).

smallest grown by any of the Deer, those of *Cervus rufinus* of the Andes of Ecuador and Columbia being, I believe, considerably larger. It will be observed that the antlers are perfectly simple, slightly curved, unbranched, and terminate in a point. The length of the antlers shed in November 1869, is 2·5 inches, that of those shed in December 1870, 2·8 inches.

25. HALMATURUS ERUBESCENS. (Figs. 5 & 6, p. 239.)

Macropus erubescens, Sclater, P. Z. S. 1870, p. 126, pl. x., et p. 669.

I regret to have to announce the recent loss of the two fine specimens of this new Kangaroo. One of these I now exhibit, that received July 20th, 1870. It agrees generally with that figured and described *l. c.*, but is of a nearly pure white on the throat and body beneath, and has the end of the tail black. The upper back is of a rich vinous colour, which is also continued over the shoulders, nape, and top of the head. The hands and feet are black. The measurements of this specimen are:—whole length, from nose to base of tail, 40 inches; tail 26 inches; length of ears nearly 5 inches; of tarsus to end of longest toe 11. The muffle of *M. erubescens* is quite naked; and the species therefore belongs strictly to the section *Halmaturus* of Mr. Waterhouse's arrangement.

The skull of the specimen (fig. 5, p. 239) shows that the animal was not yet adult, the third and fourth molars being not yet in their places. In general form it resembles most nearly that of *Macropus rufus*. The third incisor, as in that species, has but one shallow vertical groove, placed rather in front of the middle (see fig. 6, p. 239); but the whole tooth is wider and not so deep as is represented in Mr. Waterhouse's figure of the corresponding tooth in *Macropus rufus* (Mamm. ii. pl. 5. f. 3).

2. List of the Lizards belonging to the Family *Sepidæ*, with Notes on some of the Species. By Dr. A. GÜNTHER, F.R.S., F.Z.S.

[Received February 20, 1871.]

The family *Sepidæ*, as defined by Dr. Gray (Catal. Lizards, p. 121), forms a perfectly natural group of Lizards, peculiar to the African region, including the countries round the Mediterranean, Madeira, the Canaries, Madagascar, Mauritius, but not the Seychelle Islands. This family is also remarkable for exhibiting the most perfect transition from species with four well developed, though always feeble, limbs, to others in which only minute external rudiments of these organs are perceptible. Several additions having been made to this family during the last twenty years, I have thought it useful to compile a list of the species known at present, drawing also attention to those which are desiderata for the British-Museum collection.

SEPIDÆ (Gray).

I. SPHENOPS (Wagler).

1. *Sphenops sepoides* (Aud.). B.M.
Northern Africa, Syria (Senegal ?).

2. *Sphenops meridionalis* (Gthr.). B.M.
Anisoterma sphenopsiforme (A. Dum.).
Gaboon, Senegal.

II. SCELOTES (Fitz.).

1. *Scelotes bipes* (L.). B.M.
Scelotes linnæi (Gravenhorst, in Nov. Ac. Cæs. Leop. xxiii. 1. p. 376, tab. 43).
South Africa, northwards to Angola.

2. *Scelotes fierinensis* (Grandidier, Rev. et Mag. Zool. 1869, p. 340).
Madagascar.

III. SEPS.

α. HETEROMELES (D. & B.).

1. *Seps capensis*. B.M
Gongylus capensis (Smith).
Western coast of South Africa.

2. *Seps mauritanicus*.
Heteromeles mauritanicus (Dum. & Bibr.).
Algeria.

β. GONGYLUS (Wagl.).

3. *Seps ocellatus* (Forsk.). B.M.
Mediterranean region, southwards to Abyssinia; Madeira.

4. *Seps viridanus*. B.M.
Gongylus viridanus (Gravenh.).
Teneriffe.

5. ? *Seps igneocaudatus*.
Gongylus igneocaudatus (Grandidier, Rev. et Mag. Zool. 1867, p. 234).
Madagascar.

6. ? *Seps polleni*.
Gongylus polleni (Grandidier, *l. c.* 1869, p. 340).
Madagascar.

γ. SEPS (Daud.).

7. *Seps tridactylus* (Laur.). B.M.
European and African parts of the Mediterranean region.

8. *Seps monodactylus* (Gthr.). B.M.
Palestine.

IV. THYRUS (Gray).

1. *Thyrus boyeri* (Desj.). B.M.
Mauritius, Round Island.

V. SEPSINA (Bocage).

1. *Sepsina angolensis* (Bocage, Jorn. Sc. Math. &c. Lisb. 1866, p. 62).
   Angola.
2. *Sepsina grammica* (Cope, Proc. Ac. Nat. Sc. Philad. 1868, p. 318).
   South-west Africa.

VI. AMPHIGLOSSUS (D. & B.).

1. *Amphiglossus astrolabi* (D. & B.).
   Madagascar.

These species may be arranged in the following series, according to the degree of development of the limbs:—

α. *Four limbs well developed*: Gongylus ocellatus, ? Gongylus igneocaudatus, ? Gongylus polleni, Thyrus boyerii.

β. *Four feeble limbs, but with* 5 *toes*: Sphenops sepsoides, Seps capensis, Amphiglossus.

γ. *Four limbs, with less than* 5 *toes.*
Toes 4—4: Gongylus viridanus.
Toes 2—4: Sphenops meridionalis.
Toes 3—3: Sepsina, Seps tridactylus.
Toes 2—3: Seps mauritanicus.

δ. *Four rudiments of limbs, without toes*: Seps monodactylus.

ε. *Only two two-toed hind limbs*: Scelotes.

SPHENOPS MERIDIONALIS.

I am obliged to propose this name for "*Anisoterma sphenopsiforme*" (A. Dum. Arch. Mus. x. p. 180, pl. 15. fig. 3), as the genus is identical with *Sphenops*, so that the original specific name cannot be retained. *Sphenops sepoides* has 5—5 very small toes; in *S. meridionalis* the toes are still more rudimentary, and reduced in number to 2—4. Otherwise the resemblance between the two forms is so great that one would have been justified in describing them as varieties of the same species, if no other distinctive character could have been discovered. However, I find that, in the northern form, the external cleft of the mouth is continued to the ear, and has a serrated margin. In *S. meridionalis* there is a distinct space between the angle of the mouth and the ear, and there is no serrature of the margin of the mouth.

The typical specimen is said to have been received from the Gaboon. The British Museum obtained by purchase two specimens from M. Parzudaki, who stated that he had received them from Senegal.

SEPS (GONGYLUS) CAPENSIS, Smith, Zool. S. Afr. Append. p. 10.

Sir A. Smith has presented to the British Museum two small Lizards contained in a bottle, which is labelled in his own handwriting "*Gongylus capensis*." In his description (*l. c.*) he distinctly refers to a *single* specimen, two inches long, without the tail, which was lost. One of our two specimens is, indeed, of that size, and without tail; and the presence of the second specimen might be accounted for by supposing that Sir A. Smith found it among his extensive collection, *after* the publication of the Appendix, and placed it in the same bottle with the typical example.

The description itself answers well enough to our examples, except in two points. The innermost toe is described as being rather longer than the second; and a minute circular ear-opening is mentioned. Now in those examples (which have considerably suffered during the long period of their preservation) no trace of an external ear-opening can be found; and I should have described the second toe as rather longer than the innermost. Nevertheless, taking all the circumstances into consideration, I am inclined to regard the tailless example as the type of Sir A. Smith's description; and I may add that the body is surrounded by twenty-three longitudinal series of scales, and that there are seventy scales in a longitudinal series between the fore limb and vent.

This species connects *Scelotes* with *Seps*. It may be referred to the subgenus *Heteromeles*, on account of the indistinctness of the ear-opening.

SEPS (GONGYLUS) VIRIDANUS, Gravenhorst, Act. Nov. Ac. Cæs. Leopold. xxiii. p. 348.

Head as in *Gongylus ocellatus*. Limbs much more feebly developed, with only four toes; the anterior shorter than the head, the posterior shorter than the distance of the fore-limb from the extremity of the snout. Body surrounded by twenty-four longitudinal series of scales; there are seventy-five scales in a longitudinal series between the fore limbs and the vent. Ear a small round opening. Upper parts brown, with an olive-coloured band, two scales broad, on each side of the back. The brown median part on the back with small white black-edged ocelli, arranged in two longitudinal series. The ocelli are continued on the tail, but not the bands. Lower parts white.

	millims.
Total length without tail (which is injured, and partly reproduced in all the specimens)	83
Length of the head (to the ear-opening	9
Length of the fore limb	7
Length of the hind limb	15
Length of the fourth hind toe	5

Two specimens of this Lizard, said to have been brought from North-western Africa, were received from the Zoological Society *. Fortunately the British Museum possesses a third specimen, from which more accurate information with regard to the habitat is obtained. It was brought by R. M'Andrew, Esq., in the year 1852, from Orotava, on the island of Teneriffe, which locality is mentioned also by Gravenhorst.

This species is instructive in several respects. It is one of the numerous instances which prove that modifications of a rudimentary organ cannot be used as generic characters. Thus, whenever in a group of reptiles the limbs are in a more or less rudimentary condition, the number of toes indicates only specific distinctness, and sometimes it is evidently subject to even individual variation. Further, the genera *Seps*, *Gongylus*, and *Heteromeles* had been distinguished only by the differences in the number of toes of their rudimentary limbs, as we cannot take into account the more or less complete scaly covering of the external ear-opening, which is sometimes very distinct, sometimes rather indistinct, and sometimes entirely hidden by an overlapping scale. At present, we know the following modifications intermediate between the toeless *Seps monodactylus* and the five-toed *Gongylus ocellatus* :—

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* [They were purchased by the Society from a dealer along with specimens of other North-African Reptiles, June 15th, 1870 (see P. Z. S. 1870, p. 900).—P. L. S.]

	Fore toes.	Hind toes.	
Gongylus ocellatus	5	5	(well developed).
Gongylus capensis	5	5	(feeble).
Gongylus viridanus	4	4	
Seps tridactylus	3	3	
Heteromeles mauritanicus ..	2	3	
Seps monodactylus	0	0	

Consequently I am inclined to unite the species mentioned into one genus, for which the name *Seps* may be retained.

Several instances have been made known of animals restricted in their habitat to islands, and having the organs of locomotion in a much less developed state than nearly allied species of continental faunas. Speculation has seized upon these instances to connect this peculiarity of structure with the fact of insulation; and the short-limbed *Gongylus viridanus* of Teneriffe, when compared with the continental five-toed *Gongylus ocellatus*, would appear to offer another instance leading to the same way of reasoning. But then we find that *Gongylus ocellatus* is also an inhabitant of Malta, Madeira, and other small islands, without showing signs of imperfectly developed limbs, and, again, that *Seps monodactylus* and *Heteromeles* are not less continental species than *Seps tridactylus*, as also that the five-toed *Sphenops sepoides* and the short-limbed *Sphenops meridionalis* are widely spread over large districts of the same continent.

3. Descriptions of some new Insects collected by Dr. Anderson during the Expedition to Yunan. By FREDERIC MOORE, FRANCIS WALKER, and FREDERICK SMITH.

[Received February 21, 1871.]

(Plate XVIII.)

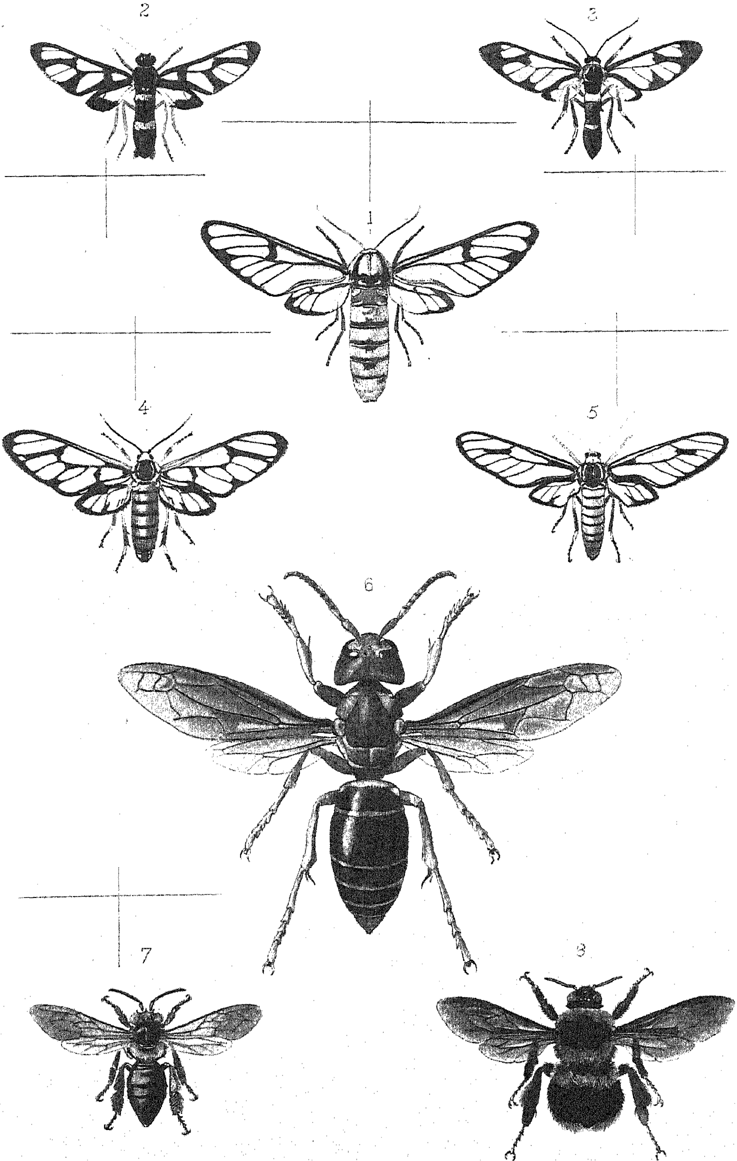
Order LEPIDOPTERA.

HETEROCERA.

1. **SYNTOMIS ANDERSONI**, Moore, n. sp. (Plate XVIII. fig. 1.)

Male and female. Wings hyaline, veins bluish black; body black, with orange-yellow bands: fore wing with the costa and exterior and

P.Z.S. 1871. Pl. XVIII.



E. W. Robinson, Del. et Sc. 1871.

NEW YUNAN INSECTS.

posterior margins black; space between the submedian vein and posterior margin pale yellow; a broad transverse discocellular black quadrate spot, which is recurved outwards: hind wing with the anterior border pale yellow, and having a small discoidal black spot; apex and exterior margin black; posterior margin tinged with yellow. Spot on front of head, coxæ, legs above, and band on each segment of abdomen beneath white. Collar round thorax, tegulæ, spots on thorax, and band on each segment of abdomen above orange-yellow; tip of abdomen in male purplish black, in female yellowish grey. Proboscis, palpi, antennæ, and legs beneath black, the antennæ tipped with white.

Expanse, ♂ $1\frac{4}{10}$, ♀ $1\frac{3}{4}$ inch.

2. Syntomis sladeni, Moore, n. sp. (Plate XVIII. fig. 5.)

Female. Wings hyaline, veins jet-black; body black, with orange-yellow bands: fore wing with a jet-black costal border of exterior and posterior margins, a narrow longitudinal streak extending from the discocellular vein halfway across the disk; veins at the base of wing tinged with orange-yellow: hind wing with a narrow jet-black border extending all round, with a short curved streak extending upward from middle of the exterior margin. Proboscis, palpi, antennæ, and eyes black. Legs black beneath, whitish above. Spot on front of head, collar round thorax, streak on tegulæ, spots on thorax above and beneath, streak on coxæ, and band on each segment of abdomen deep orange-yellow.

Expanse $1\frac{4}{10}$ inch.

3. Syntomis grotei, Moore, n. sp. (Plate XVIII. fig. 4.)

Female. Wings hyaline, veins brownish black; body black, with orange-yellow bands: fore wing with the base of costal and posterior margins orange-yellow; costa and posterior margins anteriorly and exterior margin black; a small space within base of discoidal cell, a streak beneath extending to the submedian vein, a streak anteriorly on median vein, space between the discoidal veinlets except a small rounded hyaline exterior spot, and a short space upwards from exterior margin between the second and third median veinlets brownish black: hind wing with a brownish-black border tinged with orange-yellow on anterior margin; a short black streak extending upward from exterior margin. Proboscis, palpi, and antennæ black. Front of head, collar, streak on tegulæ, spots on thorax, coxæ, and band on each segment of abdomen orange-yellow. Legs yellowish white above, brown beneath.

Expanse $1\frac{1}{2}$ inch.

4. Syntomis atkinsoni, Moore, n. sp. (Plate XVIII. fig. 2.)

Male and female. Bluish black, body with a slight purplish tinge: fore wing with seven transparent spots, the first near the base, small, rounded, the second occupying the anterior portion of the cell, the third below the cell and extending obliquely to near the posterior angle, the fourth and fifth divided by the first or upper median veinlet, the sixth and seventh divided by the lower subcostal veinlet, the latter spot being very small: hind wing with a subbasal transparent spot extending to the extreme abdominal margin, where it is tinged with yellow. Head in front and coxæ yellowish white; spot at base of abdomen above, and a band extending round the abdomen orange-yellow; anal tuft in female yellowish white. Proboscis, palpi, antennæ, and legs black; tarsi whitish; antennæ tipped with white.

Expanse, ♂ $1\frac{1}{10}$, ♀ $1\frac{1}{4}$ inch.

5. Syntomis fytchei, Moore, n. sp. (Plate XVIII. fig. 3.)

Male. Brownish black: fore wing transparent, veins black; costa and posterior margin with narrow black border; space between discoidal veinlets, the apex of wing, and exterior margin black, extending upward on the latter near the angle: hind wing with anterior margin and apex narrowly bordered with black. Front of the head white; collar round thorax, coxæ, and a basal and median abdominal band orange-yellow. Proboscis, palpi, antennæ, and legs black; tip of antennæ and tarsi whitish.

Expanse $1\frac{1}{10}$ inch.

Order ORTHOPTERA.

Fam. Acrididæ.

1. Opomala tenebrosa, Walker, n. sp.

Female. Piceous or ferruginous, slender, slightly compressed. Head and prothorax with a very slight middle keel, and with a few very slight longitudinal ridges. Tip of the vertex flat, short-conical; front tawny, oblique, speckled with black, with four well-defined diverging keels; inner keels united near the tip of the vertex. Antennæ flat, lanceolate, about twice the length of the head. Prothorax with a very slight keel on each side; fore border hardly rounded; hind border slightly rounded. Hind femora as long as the abdomen. Hind tibiæ a little shorter than the hind femora; spines stout, of equal size. Fore wings with irregular and very minute areolets; those towards the tips larger, elongated, and regular. Hind wings cinereous hyaline, blackish at the tips; veins black, pale green or pale yellow at the base and along the interior border.

Length of the body 14 lines; expansion of the fore wings 24 lines.

2. Cyrtacanthacris punctipennis, Walker, n. sp.

Male. Tawny, slender, testaceous beneath. Head short; tip of the vertex depressed, nearly round; front punctured, slightly oblique, with four well-defined diverging keels; inner keels ending in the flat ridge which extends from the tip of the vertex. Antennæ slender, a little longer than the head and the prothorax together. Prothorax with a very slight keel, which is most apparent near the hind border; four transverse impressed lines, the first, as usual, widely interrupted in the middle; fore border hardly curved; hind border slightly elongated and angular. Prosternal spine thick, oblique, rounded at the tip, approaching the mesosternum. Abdomen testaceous, with a piceous stripe which extends from the base to beyond half the length. Fore wings cinereous towards the tips, with numerous blackish points, which mostly form very irregular bands; a row of subcostal black more determinate points. Hind wings cinereous, veins black.

Length of the body 15 lines; expansion of the fore wings 30 lines.

The prosternal spine is shorter, stouter, and more obtuse than that of *C. rubiginosa*, which this species closely resembles. The speckled fore wings distinguish it from *C. spissa*.

3. MASTAX INNOTATA, Walker, n. sp.

Male. Ferruginous, slender. Head elongate, obliquely but abruptly ascending; tip of the vertex conical, prominent, slightly bilobed; front long, oblique, with four well-defined keels; inner keels converging towards the face; outer keels diverging towards the face; clypeus and fore part of the face tawny. Antennæ black, short, slender, tawny towards the base. Eyes elliptical, prominent. Prothorax short, sellate, widening hindward, with a slight keel; a blackish mark on each side in front of the transverse impressed line. Hind femora as long as the abdomen. Hind tibiæ slender, piceous, a little longer than the hind femora; spines small. Fore wings narrow, cinereous, with two pellucid marks near the tips, the mark on the hind border larger and more remote from the tip than the other, which is costal. Hind wings cinereous hyaline, with a blackish costal line; veins black.

Length of the body 10 lines; expansion of the fore wings 20 lines.

4. OXYA DIMINUTA, Walker, n. sp.

Male. Tawny, slender. Head and prothorax with two ferruginous stripes, which do not extend beyond the fourth transverse impressed line of the prothorax. Head slightly elongate; vertex with two keels between the eyes; tip depressed, transverse, subrhomboidal; front hardly oblique, with four strongly marked keels; inner keels slightly curved towards the vertex, parallel towards the face; outer keels diverging towards the face. Antennæ slender, piceous towards the tips. Prothorax with a keel, which is hardly apparent except towards the hind border; the latter rounded. Prosternal spine long, acute, rather slender. Spines of the tibiæ with black tips. Wings half developed. Hind wings cinereous hyaline, veins black.

Length of the body 10 lines.

5. CALOPTINUS INCOMPTUS, Walker, n. sp.

Male. Tawny, testaceous beneath. Head short; vertex with two slender furrows between the eyes; tip flat, subrhomboidal; front in structure like that of *C. inamœnus*. Antennæ slender. Prothorax with a slight keel and with the usual transverse impressed lines; hind border elongated, slightly angular. Prosternal spine stout, long, slightly acute. Hind legs testaceous; spines of the tibiæ with black tips. Fore wings cinereous, tawny towards the base, with some irregular and indistinct pale brownish bands formed by clouded veins. Hind wings pellucid, cinereous about the tips; a tawny costal streak; veins pale yellow, black towards the tips.

Length of the body 10 lines; expansion of the fore wings 20 lines.

Very closely allied to *C. inamœnus*. The keel of the prothorax is more strongly defined than that of *C. signatipes*.

6. CALOPTINUS INAMŒNUS, Walker, n. sp.

Male. Piceous. Head short; vertex with two slender furrows between the eyes; tip flat, subrhomboidal; front punctured, erect, with four distinct keels; inner keels slightly diverging from the vertex to the face; outer keels nearly parallel. Antennæ tawny, as long as the head and the prothorax together. Prothorax with a slight keel, with the usual four transverse impressed lines, and with two colli on each side; fore border hardly rounded; hind border slightly elongated and angular. Pectus and abdomen testaceous, the latter piceous above towards the base. Prosternal spine long and stout, rounded at the tip. Hind femora with three black spots on the upperside, and with a black stripe beneath. Hind tibiæ red, their spines with black tips. Fore wings cinereous, brownish towards the tips, with several indistinct and irregular bands formed by brownish-clouded veins; costa rounded near the base. Hind wings cinereous; a ferruginous costal streak; veins black, greenish white at the base and along the interior border.

Length of the body 12 lines; expansion of the fore wings 22 lines.

The vertex between the eyes is narrower than that of *C. brunneus*.

Order HYMENOPTERA.

1. VESPA BELLONA, Smith, n. sp. (Plate XVIII. fig. 6.)

Female. Head, thorax, and legs pale yellowish brown; the eyes dark fuscous; the teeth and inner margin of the mandibles black; the flagellum of the antennæ fuscous above towards the apex; a fuscous spot in front of the intermediate and posterior coxæ; the prothorax with a black transverse spot above; the wings fusco-hyaline, darkest at the anterior margin of the superior pair and towards their base. Abdomen black, with a narrow yellow marginal band on each segment at its apex; the apical segment entirely black; the extreme base of the abdomen with indistinct yellowish stains. Length 1 inch 6 lines.

Worker. Closely resembles the female; but in the single example received the abdomen has only a yellow margin to the basal segment; all the tarsi are fuscous, with the claw-joint yellowish; the flagellum is not fuscous above. Length 10 lines.

This species is nearly allied to *Vespa magnifica*. The head of the female is widened towards the thorax, as in that species, and is deeply emarginate behind; the clypeus and mandibles are not so strongly punctured, and the apical segment of the abdomen is not yellow as in *V. magnifica*. *Vespa basalis* resembles this species, but it differs in being covered with a short glittering pilosity, and its clypeus is smooth, shining, and impunctate.

2. **Bombus impetuosus**, Smith, n. sp. (Plate XVIII. fig. 8.)

Female. Black; the pubescence on the head black. The thorax above and at the sides clothed with a rich fulvous pubescence; the disk with black pubescence between the wings; the apical joints of the anterior and intermediate tarsi and the posterior pair entirely obscure rufo-piceous; the posterior tibiæ have their outer margin of the same colour, but brighter; wings dark brown. Abdomen: the basal segment is covered above with bright pale fulvous pubescence, the two following segments have a clothing of black pubescence, and the three apical ones of red. Length 9 lines.

The *worker* is clothed like the female, but the fulvous pubescence is brighter and paler, and it varies in size from 8 to 10 lines.

3. **Apis laboriosa**, Smith, n. sp. (Plate XVIII. fig. 7.)

Worker. Black; the vertex shining and having some long black pubescence; the face just above the insertion of the antennæ with fulvous pubescence; the eyes have a short black pubescence and a few scattered punctures; the cheeks covered with pale fulvous pubescence. Thorax clothed with fulvous pubescence, which is palest beneath and on the inferior margins of the anterior and intermediate femora; the posterior femora more thinly fringed with pale fulvous pubescence; the posterior tibiæ and the basal joint of the tarsi fringed with black pubescence; the superior wings slightly smoky or fuscous, darkest in the marginal and first submarginal cell. Abdomen almost naked, but with a little fulvous pubescence on the margin of the basal segment; the truncation of the basal segment covered with fine short downy fulvous pubescence; the apex of the abdomen with a little black pubescence. Length 8 lines.

I cannot but consider this a distinct species from all that have hitherto been described. I am not desirous of increasing the number; but, after a careful examination of the characters in which specific distinctions are to be found, I will point out in what this Bee differs from both *A. dorsata* and *A. zonata*, both of which agree with it in size. The ocelli are smaller and more distant from the compound eyes; and it has only twelve transverse rows of bristles on the inner surface of the posterior metatarsus, exclusive of that on its apical margin. In *A. dorsata* the abdomen is covered above with a short downy pubescence; this Bee has the abdomen naked, and there is not a trace of bands of pubescence at the basal margins of the segments, as in *A. zonata*.

DESCRIPTION OF PLATE XVIII.

Fig. 1. *Syntomis andersoni*, p. 244.
2. —— *atkinsoni*, p. 245.
3. —— *fytchei*, p. 246.
4. —— *grotei*, p. 245.
Fig. 5. *Syntomis sladeni*, p. 245.
6. *Vespa bellona*, p. 248.
7. *Apis laboriosa*, p. 249.
8. *Bombus impetuosus*, p. 249.

4. Descriptions of some new Species and a new Genus of *Pierinæ*, with a Monographic List of the Species of *Ixias*. By A. G. Butler, F.L.S., F.Z.S., &c.

[Received February 27, 1871.]

(Plate XIX.)

Genus Colias, Fabricius.

Colias imperialis, n. sp. (Plate XIX. fig. 2.)

♂. *Alæ supra aurantiacæ: anticæ area externa late fusca, flavo squamosa; macula marginem costali-externum attingente venisque nigris; basi costaque basali flavo-virescentibus; margine extremo costali fulvo; striolis tribus subapicalibus flavis in venis positis; ciliis fulvidis: posticæ area costali fusca, externa late nigra, abdominali flava: corpus fuscum, virescens; antennis fuscis, clava compressa.*

Alæ subtus flavo-virescentes: anticæ area discoidali fulvo tinctæ; puncto triangulari fulvo pupillato discocellulari; fascia discali nigro-fusca a margine interno ad ramum tertium medianum currente, extrorsum profunde dentata, introrsum diffusa; area interna late rufo-fusca; ciliis roseis: posticæ area medio-discali fulvo tincta; macula discocellulari aurantiaca fusco cincta, punctis duobus aurantiacis basalibus: corpus flavum, pedibus roseis.

Exp. alar. unc. 2.

♀. *Alæ supra maculis tribus subapicalibus et duabus subanalibus inter venas aureo-flavis; fundo obscuriore, aliter velut in mare: posticæ fuscæ; dimidio interno fulvo squamoso; fascia maculari discali maculis, e quibus duabus superioribus flavidis, inferioribus longioribus fulvis; area abdominali pallide sulphurea: corpus nigrescens, capite roseo hirto.*

Alæ subtus pallide virides: anticæ dimidio interno fulvo; marginibus costali et externo roseis; fascia submarginali ad ramum discoidalem superiorem continuata, aliter velut in mare: corpus albidum.

Exp. alar. unc. 1, *lin.* 11.

Port Famine (*King*)? Three examples, B.M.

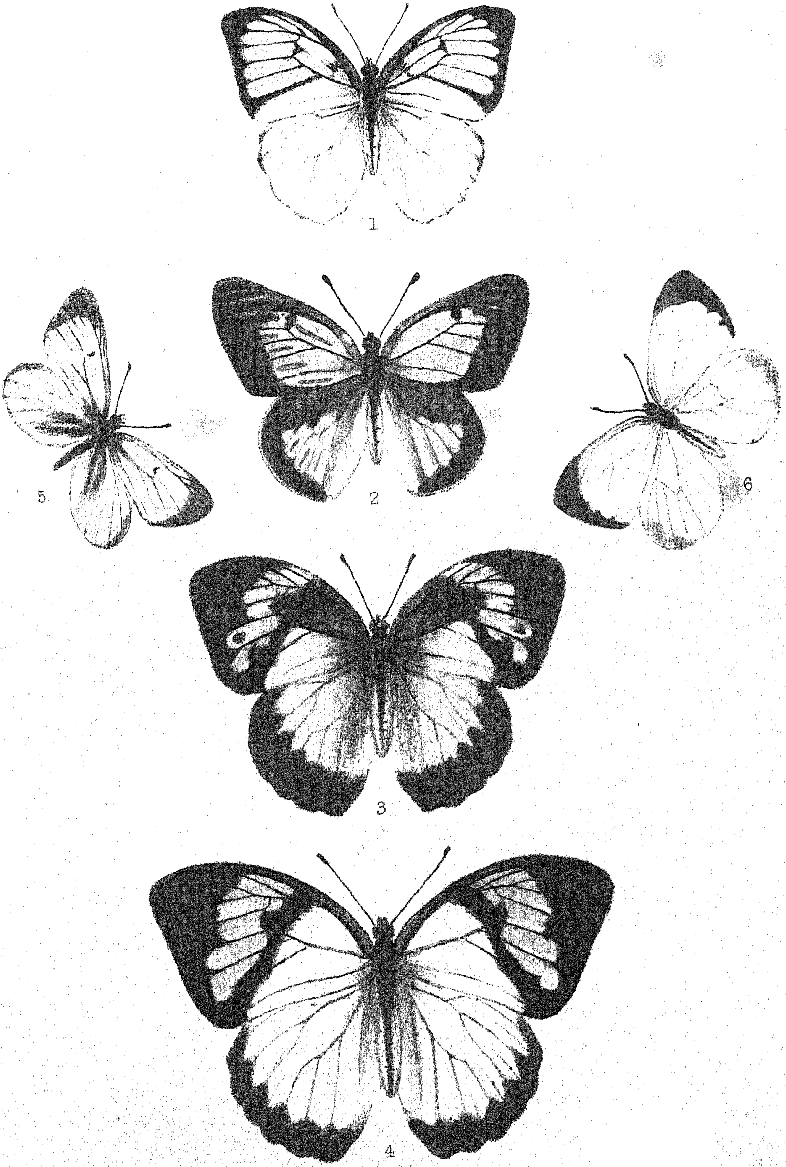
From the supplementary cases of the Banksian cabinet; in company with a collection from Port Famine, presented by Capt. King. Allied to *C. thisoa*, *hecla*, &c., especially the female.

Scalidoneura, n. gen.

Affinis Coliadi (*sect.* dimeræ *et* euxanthis); *alis angustioribus, antennis tenuioribus, clava robusta.*

Alæ anticæ subtriangulares, vena costali pone medium costæ terminata; ramo primo subcostali pone medium cellæ discoidalis

P. Z. S. 1871. Pl. XIX.



G. Willis del. et lith.
Mintern Bros. imp.

New or rare Pierinæ.

emisso, secundo et tertio valde oblique pone cellam emissis, quarto et vena superiore discoidali furculam perbrevem formantibus; vena superiore discocellulari perbrevi transversa, inferiore profunde introrsum angulata; ramis secundo et tertio medianis modice approximatis: alæ posticæ velut in Coliade (*sect.* dimeræ, *&c.*) *: corpus hirtum, palpis elongatis tenuibus cirratis, articulo terminali projecto.*

Typus S. hermina, *sp. n.*

SCALIDONEURA HERMINA, sp. n. (Plate XIX. fig. 5.)

♂. *Alæ supra fulvæ: anticæ basi flavida, nigro squamosa; puncto discocellulari nigro; costa et margine externo (ad angulum analem gradatim decrescente et introrsum arcuato) fuscis; ciliis roseis ad angulum ani flavescentibus: posticæ area basali flava, plaga magna interna, extrorsum diffusa nigra; margine apicali fusca; ciliis albidis: corpus nigrum, sericeo-albo hirtum; capite fusco viridique hirtum; antennis fuscis, fulvo acuminatis.*

Alæ subtus multo pallidiores, undique fusco roratæ; fasciis supernis flavo-virescentibus (haud fuscis); plaga posticarum viridi: posticæ stria discoidali, puncto adhærente basali, macula discocellulari argenteo pupillata maculisque septem discalibus arcuatim dispositis, roseo-fuscis: corpus virescens, palpis pedibusque roseo tinctis.

Exp. alar. unc. 1, *lin.* 7½.

Eastern Peru (*Degand*). B.M.

Somewhat resembles the males of *C. dimera* and *euxanthe*; but differs in neuration from all the other *Pieridian* genera.

Genus TERIAS.

TERIAS MEMULUS, sp. n. (Plate XIX. fig. 6.)

♂. *Alæ supra flavæ: anticæ margine externo fere velut in* T. blanda, *ad angulum ani autem arcuatim decrescente, introrsum quinquesinuata, sinibus duobus superioribus multo latioribus; costa et basi nigris: posticæ venis nigro acuminatis, margine apicali aurantiaco nebuloso: corpus nigrum, viridi hirtum, abdomine lateraliter flavo.*

Alæ subtus fere velut in T. leuce.

Exp. alar. unc. 1, *lin.* 8.

♀. *Alæ supra flavæ, anticæ velut in* T. leuce ♀*: posticæ maculis tribus increscentibus marginalibus apiceque aurantiacis; venis nigro acuminatis: corpus velut in mare.*

Alæ subtus fere velut in T. dina ♀*; anticæ autem area magna apicali triangulari; posticæ area subquadrata striolaque externa adhærente, ferrugineis, violaceo et fusco roratis.*

Exp. alar. unc. 1, *lin.* 9.

Haiti (*Tweedie*). B.M.

A striking new species of the *westwoodii* group.

Genus IXIAS, Hübner.

IXIAS UNDATUS, sp. n. (Plate XIX. fig. 4.)

♂. *Alæ supra fere velut in* I. evippe; *fascia autem aurantiaca angustiore magis undata, introrsum ad cellæ finem profunde incisa: posticæ fascia marginali angulis alternis profunde septemundata: corpus viridi-cinereum, abdomine a latere flavido.*

Alæ subtus saturatius flavæ, immaculatæ.

Exp. alar. unc. 3.

Labuan (*Lowe*). B.M.

Nearly allied to *I. evippe* of Drury (*rhexia*, Fabr., and, possibly, *ludekingii*, Vollenhoven), but with the costa of fore wings more produced.

IXIAS LATIFASCIATUS, sp. n. (Plate XIX. fig. 3.)

♂. *Affinis* I. sesiæ, *magnitudine* I. anexibiæ; *differt fascia marginali alarum posticarum duplo latiore et introrsum apud apicem tridentata.*

Alæ subtus undique fusco reticulatis; fascia discali nebulosa maculari fusca: anticæ macula magna discocellulari, venis plagaque triangulari anali nigro-fuscis: posticæ macula costali aliisque venas terminantibus nebulosis et puncto discocellulari nigro-fuscis; punctis quatuor inconspicuis discalibus aurantiacis: corpus flavum.

Exp. alar. unc. 2, *lin.* 6.

♀. *Alæ anticæ fuscæ, plaga magna interna triangulari lactea; fascia fulva bimaculata velut in* I. sesia ♀, *posticæ lacteæ; fascia lata marginali apud apicem introrsum tridentata, fusca: corpus cinereum.*

Alæ subtus fere velut in mare.

Exp. alar. unc. 2, *lin.* 6.

Moulmein (*Clerk*). B.M.

Allied to the preceding species and to *I. sesia*, Fabr.; in the dusky hatchings of the under surface, it differs from all the species hitherto described.

The species of *Ixias* will now stand as follows:—

1. IXIAS EVIPPE.

♂. *Papilio evippe*, Drury, Ill. i. pl. 5. fig. 2 (1773).

P. rhexia, Fabricius, Syst. Ent. p. 476. n. 145 (1775).

Var.? *Thestias ludekingii*, Vollenhoven, Tijd. Ent. iii. p. 126 (1860); Monogr. Pier. p. 49. n. 1, pl. 5. fig. 6 (1865).

♀. *Papilio pirithous*, Fabricius, Syst. Ent. p. 483. n. 179 (1775).

P. ulrica, Herbst, Natursyst. Schmett. v. pl. 108. figs. 9, 10 (1792).

Thestias rhexia, ♀, Butler, Fabr. Cat. pl. 1. fig. 5 (1869).

China, Nepal, Darjeeling. B.M.

Vollenhoven's *T. ludekingii* looks to me like a faded, or, perhaps, an albino male of *I. evippe*.

2. IXIAS UNDATUS.

Ixias undatus, suprà.

3. IXIAS LATIFASCIATUS.

Ixias latifasciatus, suprà.

4. IXIAS SESIA.

♂. *Papilio sesia*, Fabricius, Gen. Ins. p. 257 (1777); Donovan, Ins. China, pl. 31. fig. 2 (1798).

Thestias pirenassa, Wallace, Trans. Ent. Soc. ser. 3. vol. iv. p. 395. n. 8. pl. 9. fig. 4 (1867).

Bengal, Bhotan? ♂ ♀, B.M.

The female differs from the male in the narrowness of the subapical orange band, which also exhibits one or two oval spots between the median branches.

5. IXIAS ANEXIBIA.

♂. *Papilio pyrene*, Cramer, Pap. Exot. ii. pl. 125. figs. A–C (1779).

P. sesia, Herbst, Natursyst. Schmett. pl. 109. figs. 1–3 (1792).

Ixias anexibia, Hübner, Verz. bek. Schmett. p. 95. n. 1008 (1816).

♂ ♀, Punjaub; ♂ ♀, var., Bengal. B.M.

Chiefly differs from the preceding in its slightly superior size, more strongly margined hind wings, and in the colour of the subapical band in the female, which, in the typical form, is sulphur-yellow, but in the Bengalese variety yellowish white. The male of the latter is that represented by Cramer at figs. A & B.

6. IXIAS PYRENE.

♂. *Papilio pyrene*, Linnæus, Mus. Lud. Ulr. p. 241 (1764).

♀. *P. ænippe*, Cramer, Pap. Exot. ii. pl. 105. figs. C, D (1779).

China, Silhet, Bhotan. B.M.

Differs from the preceding species in the almost spotless hind wings, the marginal band being reduced to two or three squamose subapical spots, sometimes entirely wanting.

7. IXIAS BALICE.

♂. *Thestias balice*, Boisduval, Sp. Gén. Lép. i. p. 593. n. 4 (1836).

Java (*Horsfield*). B.M.

Remarkable for the great width of the orange apical patch which surrounds the discoidal spot, and unites with the yellow ground-colour.

8. IXIAS MARIANNE.

♂ ♀. *Papilio marianne*, Cramer, Pap. Exot. iii. pl. 217. figs. C–E (1782).

♂. *Ixias bebryce*, Hübner, Verz. bek. Schmett. p. 95. n. 1009 (1816).

♂. *Papilio sesia* (part.), Fabricius, Mant. Ins. p. 22. n. 234 (1787).

♂ ♀, Punjaub, Ceylon; ♀ var., Moulmein. B.M.

9. IXIAS? ANNÆ.

Thestias annæ, Wallengren, Lep. Rhop. Caffr. p. 16 (1857).

Caffraria (*Wahlberg*), *Wllgr.*

As I have not seen this species, I am unable to decide its true position. Dr. Wallengren compares it to *I. marianne*; but I think it possible it may prove to be an *Eronia*.

10. IXIAS VENATRIX. (Plate XIX. fig. 1.)

♂. *Thestias venatrix*, Wallace, Trans. Ent. Soc. 3rd ser. vol. iv. p. 393. n. 5 (1867).

Moulmein. Type, B.M.

A pretty little species, allied to *I. venilia*.

11. IXIAS VENILIA.

♂. *Pieris venilia*, Godart, Enc. Méth. ix. p. 121. n. 7 (1819); Lucas, Lép. Ex. pl. 36. fig. 1, *Anth. ven.* (1835).

Var. *Thestias crenis*, Boisd. Sp. Gén. Lép. i. p. 594. n. 5 (1836).

Java (*Horsfield*). B.M.

12. IXIAS REINWARDTII.

Thestias reinwardtii, Vollenhoven, Tijd. Ent. iii. p. 125 (1860); Monogr. Pier. p. 50. n. 2, pl. 6. fig. 1 (1865).

Baly, Lombock. B.M.

13. IXIAS VOLLENHOVII.

Thestias vollenhovii, Wallace, Trans. Ent. Soc. ser. 3. vol. iv. p. 393. n. 5 (1867).

T. balice, Vollenhoven, Monogr. Pier. p. 50. n. 3 (1865).

Timor (*Wallace*).

I have not examined specimens of the above; but I suppose its position to be next to *I. balice*.

The two following species will have to be referred also to this genus, although in many respects they resemble the species of *Teracolus*:—

14. IXIAS EULIMENE.

♂ ♀. *Pontia eulimene*, Klug, Symb. Phys. pl. 7. figs. 5–8 (1829).

White Nile. ♂, B.M.

15. IXIAS VENATUS.

♀? *Ixias venatus*, Butler, Trans. Ent. Soc. London, pl. 7. fig. 7 (1871).

White Nile. Type, B.M.

The type having lost its abdomen, I have been unable to determine its sex; I believe it to be a female.

5. Notes on the Birth of a Hippopotamus in the Society's Gardens. By A. D. Bartlett, Superintendent.

[Received March 7, 1871.]

(Plate XX.)

Towards the end of last year the keeper of the Hippopotamus (Michael Prescot) and myself noticed a considerable change in the habits and appearance of the female; and the only way that we could account for this change was by supposing that she was with young.

That these suspicions were well founded was soon made evident, and she began to display her temper towards her keeper in a very disagreeable way, occasionally turning him out of her house with very short notice. These indications, together with her increasing size, and the enlargement of her mammæ, left no doubt about the matter. Having been informed by Mr. Hegt, the Superintendent of the Zoological Gardens of Amsterdam, that the period of gestation of the Hippopotamus was seven months and a few days, I was led to expect the young one about the first week in February.

I therefore wrote to my friend Mr. Westerman of Amsterdam, asking for any information he could give me upon the subject. The following is an extract from his letter.

"Our Hippopotamus always went with young from *seven months and twenty-one days to seven months and twenty-five days*; we generally could see the work of delivery begin about twenty-four hours before the young one appeared. The female is in great trouble all that time, the red sweat running down her body."

Guided by this information and by that of our keeper, I felt certain that we were near the time indicated; and we kept a very close and careful watch for any symptoms that might take place. On Monday the 21st of February we noticed a very decided change in her manner and appearance; she was restless and looked wild. I closed the doors of the house immediately, and gave instructions to the keepers not to enter the house nor to allow any one to disturb her, and commenced a strict watch upon her movements. This we could easily manage from a window in a small room above the house. From this window we could see perfectly without being seen by the animal, on account of the position of the light. Here we watched until half past 4 o'clock on the following day (just thirty hours). During the whole of this time the animal was moving about, walking round the house, lying down, and getting up again immediately, rolling on her side, going backwards and forwards, looking and holding her head upwards, opening and closing her jaws, and frequently clattering her teeth, the bloody fluid (perspiration) running down her sides and face, as it issued from every part of her skin, until one's eyes became weary of witnessing the distress and anguish displayed by this monstrous mass of restless and troubled flesh. We noticed that the slightest noise arrested her attention; and on the keeper entering the house, she rushed towards him in a perfect fury. Another sign of her temper was the fact of her not replying, as she usually does, to the call of the male, who being disturbed by her incessant movements continually called to her by his loud grunting roar, to which, in ordinary times, she is in the habit of responding. It was therefore evident to me that the event was close at hand. At last she selected a spot, upon which she carefully lay down, and for a few moments seemed quiet, when, by one sudden effort, the young Hippopotamus was shot head first into the world, as if by magic. The most remarkable feature respecting the birth was its startling quickness.

The mother was on her legs at once, and turning round, with open jaws, rushed at the little one, taking him partly into her mouth. At this critical and exciting moment, I believe, had she seen or heard any one, she would have destroyed her offspring instantly. The keeper and I almost held our breaths; we watched her rolling eyes as she paused apparently listening and wondering what to do, when, to our great astonishment, on hearing the old male utter his loud call, the new-born animal answered him, and shook his ears as if to free them from water. At this moment the female drew back, and passed her large flat tongue over the body of the little one, which by this time began to move about and attempted to walk. In these attempts it was assisted by its mother's nose, which she kept close to the little one and sometimes used to push it along. In less than half an hour after its birth, it was walking and staggering about the house, closely followed and kindly attended by its mother. Towards dark it had found a comfortable warm bed on the short straw in the corner of the house, the mother lying down with the greatest care and keeping the young one in front of her. On the following morning the young one appeared much stronger, and walked about the house two or three times, and during the day responded to the old male's call several times, the female remaining silent: both the mother and young one slept the greater part of the day. The young one was never observed to suck; but as no lights were exhibited after dark, we thought it probable the young one received its nourishment during the night.

On Thursday morning the young one was apparently asleep, the mother seemed uneasy, and, as the day advanced, we saw the young one make an attempt to rise but seemingly unable to do so. Carefully noticing all the symptoms, I concluded that it was going wrong, and determined, if possible, to remove it from its mother —a task of considerable difficulty, and one not altogther free from danger. The keeper, Michael Prescot, was the first to enter the house, and having the gates open that lead into the tank containing the water, expected that he would be able to close the gates, and keep the mother in the bath until the young one had been removed. He made the attempt; she rushed at him and into the water; but before he could close the gates she rushed out again, and stood before her young one, gnashing her teeth and threatening the keeper.

It was certain that the keeper could not remove the young one without assistance; so I sent for Arthur Thomson, a keeper, and H. North, a helper; and, knowing the great dislike the female Hippopotamus had always shown towards the garden watering-engine, I arranged for the keeper Prescot to wheel it into the house in the direction that, if she followed it, would lead her into the tank or bath. In the event of her so doing, Thomson was ordered to be ready to close the gates upon her, while I proposed to slip into the den and carry off the young one, North being ordered to unlock and lock the gate after me.

The attempt was made, and succeeded; for as soon as the female plunged into the water to attack Prescot and the water-engine, he commenced to pump the water into her face and eyes. This caused her to dive, and thus gave me time to escape before she could see what was going on.

The picking up and carrying off the young one was not quite so easily managed as I had anticipated, for I was astonished to find the little beast nearly one hundred pounds weight, and as slippery and slimy as an eel. Besides this, it struggled much in my arms.

There was no time to be lost, and by an effort the young one was removed from the house almost as quickly as it had entered it.

Placed in a warm room, on a soft bed of hay, and covered with a blanket, it seemed to revive, and, two goats supplying it with plenty of warm milk, readily sucked from a large feeding-bottle a sufficient quantity to cause us to think that we should be able to save its life. But after having taken a second meal it was attacked with convulsions, and died suddenly about 8 o'clock on Thursday night.

Since the foregoing was written, through the kindness of Professor Flower I have examined the viscera of the young animal, and have also been informed by that gentleman that the creature had been evidently suffering from inflammation of several of the internal structures for many days previous to its birth. I think, therefore, it is highly probable that this condition will account for its not having sought nourishment from its mother; had it done so, I fully believe she would willingly have allowed it to suck, as we had proof that she was well supplied with milk.

In conclusion, I must remark that I have never witnessed any thing like the suspicious, watchful, and determined manner in which this huge creature endeavours to defend her young. She is jealously fond of it; and the great danger of its being killed by her while exhibiting a blind rage on any one approaching, renders the breeding and successful rearing of these animals in captivity a task of extreme difficulty.

March 21, 1871.

R. Hudson, Esq., F.R.S., in the Chair.

The following report by the Secretary on the additions to the Society's Menagerie during the month of February 1871 was read:—

The total number of registered additions to the Society's Menagerie during the month of February 1871 was 45, of which 9 were by birth, 8 by presentation, 26 by purchase, and 1 by exchange, 1 animal having been received only on deposit. The total number of departures during the same period, by death and removals, was 100.

Amongst the additions almost the only one of special interest was two pairs of a small West-African Finch (*Spermestes fringilloides**), purchased February 14. Our Superintendent has already given us full particulars of the birth of the young Hippopotamus, which occurred February 21.

Mr. Sclater exhibited a skin of the Ceylonese *Prinia* spoken of by Mr. W. Vincent Legge in a communication to the Society read on November 1, 1870† last, and now forwarded for examination by that gentleman. Lord Walden had pronounced the specimen to be *P. socialis* of Sykes, not differing from examples collected in Coorg and Candeish.

Dr. E. Hamilton, in corroboration of Mr. Swinhoe's remarks (P. Z. S. 1870, p. 91) on the prolific nature of *Hydropotes inermis*, read the following extract from a letter lately received from Mr. J. A. Arnott of Shanghai:—

"Do you know that the doe of this species has constantly five or six young ones at a birth? We often find it so when the animal is opened, as is customary immediately after it is shot."

Dr. Hamilton observed that this corroboration of Mr. Swinhoe's observations was important. As a rule the various species of the genus *Cervus* usually only have one calf at a time. *Cervus dama* sometimes brings forth two, and occasionally, though very rarely, three; *Cervus capreolus* never more than two. It would be interesting to know whether the nearest allies to this genus (viz. *Cervus pudu* of Chili, and *Moschus moschiferus* of North-eastern Asia) have this peculiarity, as it was certainly a distinct feature in the *Hydropotes*.

The following (eleventh) letter‡ on the Ornithology of Buenos Ayres by Mr. W. H. Hudson, C.M.Z.S., was read:—

"Buenos Ayres, 2nd September, 1870.

"Sir,—Besides the Black-headed Gull (*Larus cirrhocephalus*), described in my last letter, we have in this country five species of *Laridæ*; but at present I will pass these over, and defer my descriptions of them until I shall have increased the rather scanty stock of facts I possess in reference to their habits.

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* *Ploceus fringilloides*, Lafr. Mag. de Zool. 1853, pl. 48.

† P. Z. S. 1870, p. 673.

‡ For preceding letter, see *anteà*, p. 4. See also Sclater and Salvin, P. Z. S. 1868, p. 137, et 1869, p. 158.

"I have just become acquainted with a bird never before, I think, obtained in this region—the *Upucerthia dumetoria.* A pair of these birds (male and female) appeared in a field near my house this winter; and a month after first seeing them I succeeded in shooting both. The male proved to be a trifle the larger; but in plumage they were alike. They reminded me in all their motions of the *Cinclodes fuscus*, being, like it, shy and ever ready to take wing, and their flight being irregular, rapid, and near to the earth. The bird also sometimes alights on dry stalks, but more often on the ground, hopping and jerking the tail in a startled manner, and running with extraordinary swiftness over the bare places. These birds were probably winter visitants from Patagonia; but that they regularly migrate so far north is doubtful. The species has been considered, I think, an inhabitant of the Andean regions exclusively; but I have seen one skin obtained on the Atlantic sea-board, in the southern part of this province.

"We have already many indications of approaching spring; and I regret to find that I have not been able to give so much attention to the habits of our winter species as I had intended to do, or to write so many letters as I had hoped. Before many days the cold season will have gone, and with it the birds that annually visit us from the barren tablelands of Patagonia. When I reflect how few species there are in this sombre-plumaged train, compared with the multitude that come to us in summer wearing the gay livery of the tropics, I am forced to think that Patagonia must indeed be poor in species. Yet in the interior of that country there is a fertile region, abounding in forests, and watered by a great river and its tributary streams. Whatever birds inhabit such a region certainly do not visit us, all our winter visitants, except two of the Hawks, being lovers of open bare plains, and alighting almost exclusively on the ground. It is not, however, impossible that in those districts of Patagonia adapted to the habits of Passerine birds many resident species may exist. Most anxiously do I wait an opportunity of learning something from observation of the ornithology of that country.

"I will now furnish you with a short sketch of our winter birds and their movements.

"The Osquita (*Centrites niger*) and the *Cinclodes fuscus* are the earliest to appear—the former on bare places, the latter on the margins of streams. Both are very common and found widely distributed. Very interesting in appearance is the silent little Osquita, the bright rufous on its back contrasting prettily with its other colour, the bill, feet, and plumage being intensely black, as if dyed in Indian ink; the inside of the bill and tongue is bright yellow. When they first appear the young males have almost as pale an ashy plumage as the females. Soon they become mottled with black, and before leaving us have only a few dark grey specks to distinguish them from the adults. They are quarrelsome and lively, incessantly hopping and flitting about the little spot of bare earth they attach themselves to. This may be the barren ground surrounding a Vizcacha village, a sheep-fold, or the dry trodden place where a herd of Cows is made to stand at night. They are also fond of muddy low grounds, when the grass is closely cropped. Occasionally one is seen to perch on a reed or thistle-bush; but they have so great an antipathy to trees that they will scarcely even alight on the ground near one. This characteristic of the true pampas birds is scarcely stronger in the *Anthus correndera* than in the present species.

"The *Cinclodes fuscus* is also a lively bird, and quick in its motions on the ground, but when perched on trees sits motionless in one posture. They are quarrelsome and sportive, and when pursuing each other utter a trilling excited cry. Occasionally on a warm day they attempt to sing, darting up from the ground as they utter their notes; but their voice is as destitute of melody as their plumage is of brilliant hues.

"Neither of the foregoing species is strictly gregarious; yet several individuals are usually seen near together, and the Osquitas are sometimes met with on the plain or flying in small and scattered flocks.

"The *Tænioptera variegata* appears on the eve of winter, and is subsequently found thinly and widely distributed over the plains. Their migration probably extends several degrees further north; for they are most numerous when they first appear, and at that time seem, both when running on the ground and when flying, always to be advancing north.

"Two Hawks are amongst our winter visitors—the *Hypotriorchis femoralis* and *Tinnunculus sparverius*. They come and go about the same time, are not common, but widely distributed, and resemble each other in their manner of flight, the habit of perching on a dry limb or post, and the haunting some favourite hedge or orchard throughout the winter. A person from Patagonia has informed me that the smaller Hawk is very common in summer in the neighbourhood of the settlement of the Rio Negro, and breeds there, building its nest in trees.

"There are two Gulls amongst our winter immigrants—a large black-winged Gull, and a dusky grey Gull with a black bill. These birds probably breed on the shores of the Atlantic; in winter they are found pretty widely distributed over the pampas. Wherever the hide is stripped from a dead Horse or Cow they appear, Vulture-like, to feed on the flesh, wandering away again when it is finished. These birds appear to possess no regular migration: the grey species is always very rare; and the black-winged Gull is much more numerous in some seasons than in others.

"There are also two Geese, the largest of which is the Butarda (*Bernicla magellanica*). There is a great difference between the sexes of this species, the plumage of the male being white and pale grey, that of the female of a deep brown and slate-colour. Over two degrees of latitude south of our city is the extreme northern limit of its winter migration. The neighbourhood of the south-western town of Azul is a favourite resort of these birds when they visit us; there they are found in great numbers, in flocks of from a dozen to a hundred individuals, scattered about the plain and feeding upon the clover and tender grasses. They are shy and loquacious, and chatter much during the night in frosty weather. Whether they breed in the Patagonian mainland or in the Falkland Islands I cannot say, but have been told that in the last region they are very numerous in summer.

"The lesser dark brown Goose, called here *Pato de la Sierra* *, and resembling the female *Butarda*, advances much further north than that bird, but is seldom seen within fifty miles of Buenos Ayres city. That far south of the city is the resort of the advance flocks; they annually visit the same place in considerable numbers, and remain in it so faithfully through the season that we might fancy they had agreed to consider it a boundary line, over which it was not safe or lawful for them to pass.

"Of the family that includes Snipes, Plovers, &c. we have five winter species:—

"The *true* Vecasina (for this vernacular name is sometimes given to other species): a large bird, the upper plumage dark, below white, very thickly mottled with rufous red. I am inclined to think that it remains in this country all the year—in summer breeding on the extreme southern pampas, and straggling north in winter.

"The Chorlo-amarillento (*Ægialitis falklandica*) passes us late in autumn on its way to the north, few remaining through the cold season with us.

"The Chorlito de Invierno (*Eudromias modestus*) and the Gachita (*Thinocorus rumicivorus*) appear in April, are numerous, and widely distributed.

"A pretty little cinereous Plover, with a rufous head and belted breast, is also found in winter very sparsely distributed over the southern half of this state.

"Of the foregoing five species I will speak more at length when I come to treat of the families to which they appertain.

"The last on this short list is the large Curlew-like *Vanduria de Invierno* †, a bird well known for its size, its hard abrupt cry of extraordinary power, and its strongly contrasted colours—bright red legs, wings and back ash-blue, under surface and belly black, head and neck deep yellow. This bird appears in May, is very common on the pampas about the latitude 38°, becoming rarer as we advance north, and is but seldom seen north of Buenos Ayres city. They frequent dry grounds abounding in long loose grass, or sprinkled with low cardoon bushes, and feed in scattered flocks of from half a dozen to forty or fifty individuals. Their long, slender, curved bills are used much in probing, as the larvæ of the large-horned beetle are often found in large quantities in their stomachs. Often they are so intent on seeking their food that the members of a flock will all separate and wander out of sight of each other; occasionally at such times they utter loud vehement cries, as if to call their companions, or to inform each other of their whereabouts. Frequently one will suddenly lift up his wings as if to fly, and, stretching them up vertically, remain fifteen or twenty seconds in this curious attitude. At sunset they all rise up clamouring, and direct their flight to the nearest watercourse, and often on their way to the evening rendezvous go through a strange and interesting process. The whole flock suddenly precipitates itself downward through the air with a violence wonderful to see, every bird wheeling this way and that, as if striving to outvie his fellows in every wild fantastic motion of which they are capable. In this manner they reascend and descend again and again, scattering or closing together as if pursuing and then striving to avoid each other. This exercise they keep up for some time, and while it continues make the air for miles resound with their loud percussive screams. On the arrival of spring the Vandurias take their departure: their swift and easy flight might in a very short space of time convey them to the extreme southern point of this continent; but I should think, judging from their habits here and what I know of the physical condition of Patagonia, that the northern portion of that country would be their most congenial summer home.

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* [No doubt *Chloëphaga poliocephala*.—P. L. S.]

† [An Ibis, *Geronticus melanopis* (Forst.).—P. L. S.]

"Thus but fifteen Patagonian species visit us: there may be a few more, probably the *Tringa bonapartii* and perhaps a species of *Tænioptera*; but some that I have placed on the list (the Vecasina, for example) may prove to be residents of the Buenos Ayrean pampas.

"Some of our resident species appear in districts in winter where they are never seen in summer. The migrations of these birds are never very regular; the most common are the Boyero (*Tænioptera coronata*), the Burrowing Parrot, the large Wild Pigeon, and the Greater Red-breasted Lark."

Dr. Cunningham read a memoir on some points in the anatomy of the Steamer Duck (*Micropterus cinereus*), founded on specimens of this bird in various stages obtained by him during the recent survey of the Magellan Straits. The conclusion arrived at by Dr. Cunningham, after careful study of these examples, was that the so-called *Micropterus patachonicus* was only the young of *M. cinereus*—the peculiarity being that the power of flight departed from this bird as it grew adult.

This paper will be published in the Society's 'Transactions.'

The following papers were read:—

1. On the Birds of the Island of Santa Lucia, West Indies. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received March 14, 1871.]

(Plate XXI.)

Our newly elected Corresponding Member Mr. G. W. Des Vœux, Administrator of the Government of Santa Lucia, has most kindly sent to me a collection of birds formed in that island by the Rev. J. E. Semper, an English clergyman resident there. This collection is one of great interest, as very little is known of the avifauna of Santa Lucia, and every branch of the zoology of the Antilles is worthy of special investigation. Before speaking of it I may be permitted to say a few words on the present state of our knowledge of the birds of the Antilles generally.

The West-Indian Islands seem to me to constitute, as I have on former occasions explained, a distinct subdivision of the Neotropical region, which may be called the *Subregio antillensis**. This subregion is divisible into two portions, which correspond to the two usually recognized divisions of the islands into the Greater and Lesser Antilles. The former of these is characterized by the presence of the remarkable Mammal-forms *Solenodon*, *Capromys*, and *Plagiodontia*, and by several peculiar types of ornithic life, such as *Spindalis*, *Sporadinus*, *Todus*, and *Saurothera*, which run on as far as Porto Rico, but do not cross into the Lesser Antilles. The latter, if we put the Chiroptera aside, present but few traces of Mammal-life, except one or two species of Agouti (*Dasyprocta*) and Mouse (*Hesperomys*), but are tenanted by certain characteristic forms of birds, such as *Rhamphocinclus*, *Cinclocerthia*, *Orthorhynchus*, and *Eulampis*, which are not known in the Greater Antilles.

The ornithology of the Greater Antilles is now tolerably well known to us, although specimens from most of the islands are rare in collections and difficult to obtain. The Lesser Antilles, on the other hand, are still very imperfectly investigated as regards their birds, many of them being, so far as I know, still unvisited by any naturalist or collector. There can be no doubt, however, that every one of them is well worthy of being worked at, and that the results to be obtained from a thorough examination of the whole group would be of great importance towards a more complete knowledge of the laws of distribution. To show how slight our acquaintance is with this subject and how much remains to be done, I will mention the principal islands or island-groups in order, and specify what kind of knowledge we have of their ornithology.

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* Prof. Baird, in his excellent articles on the distribution and migrations of North-American birds (American Journal of Science and Arts, vol. xli.), proposes to make the West Indies a "Region" of itself. I do not think that there are sufficient reasons for adopting this course, though there is in its fauna a certain element of autochthonism which does not harmonize very well with either North or South America.

1. *The Virgin Islands.*—Of these islands we may, I think, assume that we have a fair acquaintance with the birds of St. Thomas, the most frequently visited of the group, and the halting-place of the West-Indian Mail-steamers. Mr. Riise, who was long resident here, collected and forwarded to Europe many specimens, some of which were described by myself*, and others are spoken of by Prof. Newton in a letter published in 'The Ibis' for 1860, p. 307. Mr. Riise's series of skins is now, I believe, at Copenhagen. Frequent allusions to the birds of St. Thomas are also made by Messrs. Newton in their memoir of the birds of St. Croix, mentioned below. In the 'Proceedings of the Academy of Natural Sciences of Philadelphia' for 1860 (p. 374), Mr. Cassin has given an account of a collection of birds made in St. Thomas by Mr. Robert Swift, and presented to the Academy; twenty-seven species are enumerated.

Quite at the extreme east of the Virgin Islands, and lying between them and the St. Bartholomew group, is the little islet of Sombrero, "a naked rock about seven eighths of a mile long, twenty to forty feet above the level of the sea, and from a few rods to about one third of a mile in width." Although "there is no vegetation whatever in the island over two feet high," and it would seem a most unlikely place for birds, Mr. A. A. Julien, a correspondent of Mr. Lawrence of New York, succeeded in collecting on it specimens of no less than thirty-five species, the names of which, together with Mr. Julien's notes thereupon, are recorded by Mr. Lawrence in the eighth volume of the 'Annals of the Lyceum of Natural History of New York' (p. 92).

The remaining islands of the Virgin group are, I believe, most strictly entitled to their name so far as ornithology is concerned, for no collector on record has ever polluted their virgin soil. Prof. Newton (Ibis, 1860, p. 307) just alludes to some birds from St. John in the possession of Mr. Riise.

2. *St. Croix.*—On the birds of this island we have an excellent article by Messrs. A. and E. Newton, published in the first volume of 'The Ibis'†. This memoir, being founded on the collections and personal observations of the distinguished authors themselves, and having been worked up after a careful examination of their specimens in England, and with minute attention to preceding authorities, forms by far the most complete account we possess of the ornithology of any one of the Lesser Antilles. It, however, of course requires to be supplemented by additional observations, many points having been necessarily left undetermined; and it is much to be regretted that no one seems to have since paid the slightest attention to the subject.

3. *Anguilla, St. Martin, and St. Bartholomew.*—Of this group of islands St. Bartholomew alone has, as far as I know, been explored ornithologically, and that within a very recent period. In the Royal Swedish Academy's 'Proceedings' for 1869 will be found an excel-

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* Ann. N. H. ser. 3, vol. iv. p. 225; and P. Z. S. 1860, p. 314.

† Ibis, 1859, pp. 59, 138, 252, and 365.

lent article*, by the veteran ornithologist Prof. Sundevall, on the birds of this island, founded on a collection made by Dr. A. von Göes. The species enumerated are forty-seven in number, amongst which the most interesting, perhaps, is the *Euphonia flavifrons*, originally obtained, along with one or two other species, in the latter part of the last century, and figured by Sparrman in his 'Museum Carlsonianum,' along with several other species from the same island.

4. *Barbuda.*—Of this British island I believe I am correct in saying that nothing whatever is known of its ornithology, or of any other branch of its natural history.

5. *St. Christopher and Nevis,* to which may be added the adjacent smaller islands *St. Eustathius and Saba.*—Of these islands also our ornithological knowledge is of the most fragmentary description. Mr. T. J. Cottle was, I believe, formerly resident in Nevis, and sent a few birds thence to the British Museum in 1839. Amongst these were the specimens of the Humming-birds of that island, which are mentioned by Mr. Gould in his well-known work. Of the remainder of this group of islands we know absolutely nothing.

6. *Antigua.*—Of this fine British island, I regret to say, nothing whatever is known as regards its ornithology. Amongst the many thousands of American birds that have come under my notice during the past twenty years, I have never seen a single skin from Antigua.

7. *Montserrat.*—Exactly the same as the foregoing is the case with the British island of Montserrat.

8. *Guadeloupe, Deseadea, and Marie-galante.*—An excellent French naturalist, Dr. l'Herminier, was for many years resident as physician in the island of Guadeloupe. Unfortunately, Dr. l'Herminier never carried into execution the plan which I believe he contemplated, of publishing an account of the birds of that island. He sent, however, a certain number of specimens to Paris and to the late Baron de la Fresnaye, to whom we are indebted for the only article ever published on the birds of Guadeloupe†, or of the adjacent islands.

9. *Dominica.*—Dominica is one of the few of the Caribbean islands that has had the advantage of a visit from an active English ornithologist. Although Mr. E. C. Taylor only passed a fortnight in this island in 1863, and had many other matters to attend to, he nevertheless contrived to preserve specimens of many birds of very great interest, of which he has given us an account in one of his articles on the birds of the West Indies, published in 'The Ibis' for 1864 (p. 157). It cannot be supposed, however, that the birds of this wild and beautiful island can have been exhausted in so short a space of time, even by the energetic efforts of our well-known fellow-labourer. This Society have also upon one occasion received a valuable present from Dominica, in the shape of the splendid Parrot

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* "Foglarne på ön S. Barthelemy, efter de af Dr. A. von Göes hemsända samlingarna bestämde;" af Carl J. Sundevall (Œfversigt af Kongl. Vetenshaps-Akademiens Förhandlingar, 1869, p. 579).

† Rev. Zool. 1844, p. 167.

Chrysotis angusta, presented in 1865 by Mr. P. N. Bernard*, which still lives to adorn our Parrot-house.

10. *Martinique.*—This island is one of the few belonging to the Lesser Antilles in which birdskins are occasionally collected by the residents, and find their way into the hands of the Parisian dealers. There are also a certain number of specimens from Martinique in the Musée d'Histoire Naturelle in the Jardin des Plantes, which I have had an opportunity of examining; but, beyond the vague notices given by Vieillot in his 'Oiseaux de l'Amérique du Nord,' I am not aware of any publication relating specially to the ornithology of this island. Mr. E. C. Taylor passed a fortnight in Martinique in 1863, and has recorded his notes upon the species of birds which he met with in the excellent article which I have mentioned above; but these were only few in number. The International Exhibition in 1862 contained, in the department devoted to the products of the French colonies, a small series of the birds of Martinique, exhibited by M. Bélanger, Director of the Botanical Garden of St. Pierre in that island†. This is all the published information I have been able to find concerning the birds of Martinique‡.

11. *St. Lucia.*—Of the island I am now specially treating of I believe there is no published ornithological information whatever. The little knowledge of its avifauna which I possess is derived from two sources:—first, a few specimens in the Paris Museum obtained by Bonnecourt, a French collector who visited the island in 1850 and 1851 on his way to Central America; and, secondly, a small series of unpublished coloured drawings in the Library of this Society by Lieut. Tyler, who formerly contributed to the 'Proceedings' some notes on the reptiles of that island§. The latter, although rough and unfinished, are characteristic and mostly recognizable. Some years ago I had them arranged and bound; and I think them of sufficient interest to give the subjoined list of their vernacular names according to Lieut. Tyler, and of what I believe to be their correct scientific titles.

	Lieut. Tyler's name.	Supposed scientific name.	Page
1.	Cent coups de Couteau	*Antrostomus*	1
2.		*Tyrannus rostratus*	1
3.		*Myiarchus antillensis*	1
4.	Grieve	*Margarops densirostris*	1
5.	Red-breasted Humming-bird	*Eulampis jugularis*	2
6.	Carouge, or Banana-bird	*Icterus laudabilis*	3
7.	Mauvie	*Margarops herminieri*	3
8.	Gorge-blanc	*Rhamphocinclus brachyurus*	3
9.	Coucou manioc	*Coccyzus minor*	3
10.	Peewit	*Elainea martinica*	4
11.	Ortolan, or Ground-Dove	*Chamæpelia trochilea?*	4

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* *Cf.* P. Z. S. 1865, p. 437.

† See article on Ornithology in the International Exhibition, 'Ibis,' 1862, p. 288.

‡ On animals formerly living in Martinique but now extinct, see Guyon, 'Compt. Rend.' lxiii. p. 589 (1866).

§ See P. Z. S. 1849 and 1850.

	Lieut. Tyler's name.	Supposed scientific name.	Page
12.	Rossignol	*Thryothorus martinicensis*[*]	5
13.	Grosbeak	*Saltator martinicensis*	6
14.	Grivotte	*Margarops montanus*	6
15.	Carouge (femelle)	*Icterus bonana*	6
16.	Trembler	*Cinclocerthia macrorhyncha*	6
17.	Père noir	*Loxigilla noctis*	7
18.	Sucrier	*Certhiola martinicana*	7
19.	Perdrix croissant	*Geotrygon mystacea*	8

12. *St. Vincent.*—St. Vincent was formerly the residence of an energetic and most observant naturalist, the Rev. Lansdown Guilding, F.L.S., well-known to the first founders of this Society, who, however, unfortunately died at an early age in this island without having carried out his plans for a fauna of the West Indies[†].

Mr. Guilding paid most attention to the invertebrate animals; but his collections contained a certain number of birds, amongst which was a new Parrot, described after his decease by Mr. Vigors as *Psittacus guildingii,* and probably a native of St. Vincent.

13. *Grenada and the Grenadines.*—Of the special ornithology of this group nothing is known.

14. *Barbados.*—The sole authority upon the birds of Barbados is Sir R. Schomburgk's well-known work on that island[‡]. This contains (p. 681) a list of the birds met with, accompanied by some few remarks. It does not, however, appear that birds attracted much of the author's attention; and more copious notes would be highly desirable.

Although Tobago and Trinidad are geographically reckoned in the windward division of the Lesser Antilles, they have zoologically, I believe, nothing whatever to do with them. Both have been peopled with life from the adjacent mainland; or if in the case of Tobago this was not originally the case, it has been overrun with continental species, and, as well as Trinidad, now presents few, if any, traces of Antillean forms. Of the ornithology of both of these islands we have excellent accounts—of that of Tobago by Sir William Jardine[§], from the collections of Mr. Kirk, and of that of Trinidad more recently from the pens of Dr. Léotaud[‖] and Dr. Finsch[¶].

Having thus summed up how much, or rather how little we yet know of the ornithology of the Lesser Antilles individually, I proceed to give an account of the collection of birds of Santa Lucia, for which, as above mentioned, I am indebted to the kindness of Mr. Des Vœux.

This collection contains examples of the following twenty-five species, amongst which is one that appears to have been hitherto undescribed.

[*] Sclater, P. Z. S. 1866, p. 320.

[†] See his sketch of his plans, Zool. Journ. ii. p. 437. He died in 1832.

[‡] History of Barbados: London, 1847.

[§] Annals of Nat. Hist. vols. xviii., xix., xx. (1846–47).

[‖] Oiseaux de l'île de la Trinidad: Port of Spain, 1866.

[¶] See Proc. Zool. Soc. 1870, p. 552.

1. MARGAROPS HERMINIERI.

Turdus herminieri, Lafr. Rev. Zool. 1844, p. 167.
Cichlerminia bonapartii, Sclater, P. Z. S. 1859, p. 335.

Two skins of this little-known Thrush, which was first described by Lafresnaye from specimens obtained by L'Herminier in Guadeloupe. I had previously thought it would be necessary to follow Bonaparte in making this abnormal species the type of a separate genus; I am now, however, of opinion that it may be allowed to remain with its allies of the genus *Margarops*.

The native name is given as "*Molvie*." The iris is marked "dull green;" the feet "bright yellow."

2. MARGAROPS MONTANUS, Scl. P. Z. S. 1859, p. 336.

Turdus montanus, Lafr. R. Z. 1844, p. 167.

Two specimens also of this species, likewise first obtained by L'Herminier in Guadeloupe. A specimen in my collection (purchased of the Maison Verreaux) is from Martinique.

The native name of this species is given as "*Grevotte*." The iris is marked "*light yellow*;" the feet "*dark green*."

3. RHAMPHOCINCLUS BRACHYURUS (Vieill.); Sclater, P. Z. S. 1859, p. 328.

Native name "*Gorge-blanc*." This bird was already known to occur in Guadeloupe, Martinique, and Santa Lucia.

In Tyler's drawings (pl. 8) this bird is represented standing erect, with its tail elevated and mouth open; and a note is added that it "places itself in this position and calls the other birds around it on seeing a Snake."

4. CINCLOCERTHIA MACRORHYNCHA, Sclater, P. Z. S. 1866, p. 320; Scl. et Salv. Ex. Orn. p. 21, t. 11.

This species I described in 1866 from a single specimen sent from Santa Lucia by Bonnecourt to the Paris Museum. The present examples quite agree with the description and figure already given.

Mr. Semper gives "*Le Trembleur*" as the native name of this bird, which coincides with what is stated in 'Exotic Ornithology.' The iris is noted as "yellow," and the legs as "dark green."

This species is replaced in Martinique by *C. gutturalis*, and in Guadeloupe by *C. ruficauda* (see Ex. Orn. p. 21 *et seq.*).

5. MIMUS GILVUS, Vieill.

The *Mimus* of Santa Lucia appears to agree best with specimens in my collection from Trinidad and Venezuela which I now refer to *M. gilvus*. Under this name I now include the specimens referred in my Catalogue (C. A. B. p. 9) to *M. melanopterus* of Lawrence. They are, however, rather smaller in size, and have the white ends of the tail-feathers not so long.

Sir W. Jardine has already traced this species up to Tobago (see Ann. N. H. ser. 2, xx. p. 329).

6. **Dendrœca adelaidæ**, Baird, Rev. B. N. A. p. 212.

Without comparing it with the type I should be unwilling to separate this species from the Porto-Rican *D. adelaidæ*, lately described by Baird. The single skin sent by Mr. Semper agrees with Prof. Baird's description in almost every particular. But the white continuations of the superciliaries spoken of by Prof. Baird, if present at all, are very slight in my specimen; and the bend of the wing is not yellow, although there is a slight yellowish tinge upon it.

Mr. Semper gives this bird the name of the "*Sucrier gran-bois.*" The measurements of the skin are:—Whole length 4·4, wing 2·2, tail 2; the third and fourth primaries are nearly equal and longest.

7. **Vireosylvia calidris** (Linn.).

Vireosylvia calidris, Baird, Review of A. B. p. 329.
Vireosylvia altiloqua, Scl. Cat. A. B. p. 43.

Mr. Semper's skins agree with other specimens of this species in my collection. Mr. Semper gives the vernacular name of this bird as *Mabelle*, and describes the iris as "light claret-colour."

8. **Certhiola martinicana** (Gm.).

Certhiola albigula, Bp. Notes Orn. p. 51.

I have forwarded the single specimen of this species contained in the collection to Dr. Finsch, who is engaged on a monograph of the genus. Dr. Finsch tells me that it is "undoubtedly identical with *C. martinicana* of Martinique."

The *Certhiola* of Dominica (*C. dominicana*) is, according to Mr. Taylor (Ibis, 1864, p. 167), very readily distinguishable.

The vernacular name of this species is given as "*Sucriere.*" The iris is described as "brown," and the feet as "dark green."

9. **Myiadestes genibarbis**, Sw. Nat. Libr. xiii. p. 134, pl. 13; Baird, Rev. B. N. A. p. 423.

Prof. Baird is, I believe, right in regarding this bird as distinct from *M. solitarius* of Jamaica, although the two species are very closely allied. The only differences are:—(1) the large white chin-spot in *M. genibarbis*, which is but slightly shown in *M. solitarius*; (2) the corresponding larger size of the white rictal spot in *M. genibarbis*; (3) the white striated ear-coverts in *M. genibarbis*, the ear-coverts in *M. solitarius* being very nearly uniform; and (4) the greater extension of rufous over the lower belly in *M. genibarbis*. In other respects the two species are so much alike that I find I have had a skin of *M. genibarbis* long in my collection, confounded with *M. solitarius*.

I have compared the Santa-Lucia skins of this bird with two examples of *M. genibarbis* in the Swainsonian collection at Cambridge (which, although not so marked, are in all probability typical specimens), and find them agree. They also agree with Swainson's figure and description, particularly as regards the striated ear-coverts, except that he does not expressly mention the white chin.

I have never yet met with any specimens of *Myiadestes* agreeing with *M. armillatus* (Vieill.), with rufous terminations to the thighs. In four specimens of *M. solitarius* now before me, and five of *M. genibarbis*, the thighs are ashy. It is possible that *M. armillatus*, verus, may be the species from St. Domingo, where there is an unknown representative of this form*.

This species is probably the *M. armillatus* of Martinique spoken of by Vieillot (Enc. Méth. p. 824), and the *Solitaire* of St. Vincent found in the *Souffrière* of St. Vincent, described by Hill in Gosse's 'Jamaica' (p. 200).

Mr. Semper's notes state that this bird is known in Santa Lucia as the "*Siffleur montagnie*."

10. SALTATOR GUADELUPENSIS, Lafr.; Scl. C. A. B. p. 97.

These skins agree perfectly with a specimen in my collection from the same island. I have also lately received a skin from Martinique, which does not differ. I am therefore of opinion that *S. martinicensis* of Bp. Consp. p. 489 is identical, as already implied in my remarks P. Z. S. 1856, p. 76.

Mr. Semper gives this bird the name of "*Gros-bec*," and notes the iris as "green," and the feet as "light dull green."

11. LOXIGILLA NOCTIS (Linn.); Sclater, C. A. B. p. 601.

Père-noir de la Martinique, Buff. Pl. Enl. 201. f. 1.

Mr. Semper's single specimen agrees with a Martinique skin in my collection, except in having the superciliary mark rather shorter (only just reaching the eye), and no rufous at all on the crissum. It will be interesting to ascertain whether these differences are constant.

In Santa Lucia this bird is called "*Père-noir*," as, according to Buffon and other authors, it is in Martinique.

12. ICTERUS LAUDABILIS, sp. nov. (Plate XXI.)

Niger: tectricibus alarum superioribus minoribus, subalaribus, dorso postico et ventre imo cum lateribus et crisso aurantiaco-flavis: remigum marginibus interioribus grisescentibus: rostro et pedibus nigris: long. tota 8·9 *poll. Angl., alæ* 4·3, *caudæ rectr. med.* 4·2, *lat.* 3·5, *rostri a rictu* ·95.

Hab. Ins. Sta. Lucia.

Obs. Sp. *I. portoricensi* affinis, sed crassitie majore, et dorso imo ventreque latius aurantiacis, neque flavis, distinguenda.

Of this *Icterus* three skins, all alike, are in the collection, one, probably a female, being rather smaller in dimensions. The native name is given as "*Carrouge*:" iris "dark red-brown;" feet "dark green."

This species belongs to the group of West-Indian *Icteri* represented in Cuba by *I. hypomelas*, in St. Domingo by *I. dominicensis*, and in Porto Rico by *I. portoricensis*†. Of these it most resembles the latter, having the lower back, belly, and crissum yellow, but of an orange (not sulphur) yellow. This yellow colour is also much wider both above and below, and embraces the upper tail-coverts, which in *I. portoricensis* are black.

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* *Cf.* Sclater and Salvin, Ex. Orn. p. 56.

† *Cf.* Cassin, Proc. Acad. Sc. Phil. 1867, p. 58.

Lieut. Tyler appears to have figured this bird in his drawings (fig. 6) as the "Carouge, male;" whilst his "Carouge, female" (fig. 15) is much more like *Icterus bonana* of Martinique, which may probably also occur in Santa Lucia.

13. QUISCALUS LUGUBRIS, Sw.; Scl. C. A. B. p. 141. "Merle," indig.

Quiscalus barita, Taylor, Ibis, 1864, p. 168.

Apparently undistinguishable from skins in my collection from Trinidad, Cayenne, and Guiana. The bill is slightly more curved on the culmen, but not long enough for *Q. inflexirostris*, Sw. (An. in Men. p. 300). I have exactly similar skins from Martinique, the male being one of Mr. Taylor's specimens, determined by him as *Q. barita*. But Mr. Cassin has recently shown* that the *Gracula barita* of Linnæus must be referred to the Jamaican species usually called *Q. crassirostris*, Sw.

14. ELAINEA MARTINICA (Linn.).

Tyrannula martinica, Cassin, Pr. Ac. Sc. Phil. 1860, p. 375.
Elainea martinica, Taylor, Ibis, 1864, p. 169.

Two skins of an *Elainea* sent by Mr. Semper are, no doubt, of this species, as identified by Mr. Cassin, *l. s. c.* As far as I can tell from the present specimens, they are likewise undistinguishable from my *E. riisii* of St. Thomas (Cat. A. B. p. 217).

A further question arises, as I have already pointed out (P. Z. S. 1870, p. 834), whether this Antillean species is really separable from *E. pagana* of the continent. This I am not able at present to determine satisfactorily.

15. MYIOBIUS LATIROSTRIS, Verreaux, Nouv. Arch. d. Mus. ii. Bull. p. 22, t. 3. f. 2 (1866).

Two skins of this little Tyrant-bird, which M. Jules Verreaux has recently described from specimens transmitted to the Museum of Paris by Bonnecourt.

Its nearest ally is *Myiobius phæocercus* (*Mitrephorus phæocercus* of my Cat. A. B. p. 228), which it greatly resembles in general colour. But it has a much broader bill, and no bars on the wings.

In Santa Lucia this bird is called the *Gobemouche Solitaire*. The iris is marked "brown;" and the legs in the living bird dark green.

16. MYIARCHUS ERYTHROCERCUS, Sclat. et Salv. P. Z. S. 1868, p. 631.

I have long had a skin of this bird from Dominica, collected by

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* Pr. Acad. Phil. 1866, p. 405.

Mr. Taylor*, and have given it a MS. name. But after carefully recomparing it with my series of *M. erythrocercus*, I cannot find sufficient grounds for separating it. The Santa Lucia skins are rather larger than that from Dominica, and have the rufous portion of the inner webs of the rectrices still wider.

Mr. Semper gives the vernacular name of this species as the "*Pipperie Gran-bois.*"

17. TYRANNUS ROSTRATUS, Sclater, Ibis, 1864, p. 87.

This Tyrant-bird, which is allied to *T. griseus* (sive *dominicensis*) of the Larger Antilles, but remarkable for its large bill, was originally described by me in a note to one of Mr. Taylor's papers on West-Indian birds in 'The Ibis' for 1864. Mr. Taylor's specimen being, as he has stated, from Trinidad, I came to the conclusion that the example in my collection might really be from Cayenne, as I had always supposed from the style of preparation. But I have more recently ascertained that an exactly similar preparation is found in some skins from Martinique, and therefore think it more likely that my example of *T. rostratus* may have been obtained there. If such is the case, I think it is just possible that Mr. Taylor may have made an error in the locality of his skin, and may have collected it in Martinique or Dominica (which he also visited), and not in Trinidad.

In Santa Lucia Mr. Semper tells us *Tyrannus rostratus* is called "*Pipperie*"—a usual name for the larger *Tyranni*, I believe, in the French colonies.

18. EULAMPIS JUGULARIS (Linn.); Gould, Mon. ii. pl. 82. "*Bronze-winged Humming-bird,*" indig.

Mr. Gould gives "Nevis" as the only certain locality of this Humming-bird. Mr. Taylor obtained it in Dominica and Martinique (Ibis, 1864, p. 169). We have now examples from St. Lucia.

19. EULAMPIS HOLOSERICEUS (Linn.); Gould, Mon. ii. pl. 83. "*Emerald Humming-bird,*" indig.

I have also skins of this species from St. Croix (*Newton*), Dominica (*Taylor*), and Martinique. I cannot quite appreciate the distinctness of Mr. Gould's *E. chlorolæmus*, from some unknown island, though Mr. Gould has kindly done his best to make me realize it.

20. ORTHORHYNCHUS ORNATUS, Gould, Mon. iv. pl. 206. "*Gold-headed Humming-bird,*" indig.

Mr. Semper's skins agree with one in my collection obtained by Mr. Taylor in Martinique, which has been referred to *O. exilis* (Ibis, 1864, p. 170). But Mr. Gould now pronounces both the Santa Lucia and Martinique skins to belong to his *O. ornatus*, which is thus geographically as well as structurally intermediate between *O. cristatus* of Barbadoes and St. Vincent and *O. exilis* of the Virgin Islands and Nevis.

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* *Cf.* Ibis, 1864, p. 169.

21. CROTOPHAGA ANI (Linn.). "*Merle Corbeau,*" indig.

22. COCCYZUS MINOR (Gm.); Sclater, P. Z. S. 1870, p. 166. "*Coucou manioc,*" indig.

Iris "dark brown." Mr. Semper's specimen agrees with the skin already in my collection from Santa Lucia.

23. TINNUNCULUS SPARVERIUS (Linn.).

The skins of this Kestrel from Santa Lucia have very dark bands on the back and tail, and no chestnut spot on the head of the male, as in specimens from St. Croix.

Mr. Semper gives the vernacular name of this bird as "*Gre-grec Falaise,*" and describes the iris as "pale reddish brown."

24. BUTORIDES VIRESCENS (Linn.). "*Cayalie,*" indig.

This Little Bittern occurs in St. Croix (Newton, Ibis, 1859, p. 261) and most of the other Antilles, except Trinidad, where *B. cyanurus* (sive *scapularis*) comes up to meet it (see Finsch, P. Z. S. 1870, p. 589).

25. NYCTICORAX VIOLACEUS (Linn.).

A single skin of a young bird of this rather widely spread species, which likewise occurs in St. Croix (Newton, *l. c.* p. 262).

As I am expecting to receive further collections of the birds of Santa Lucia, I will defer remarks on the general character of the ornithology of the island to a future occasion. It may, however, be pointed out that it is quite evident, even from the present small series, that the general facies of the Santa Lucian avifauna closely resembles that of the neighbouring islands Dominica and Martinique. Although we are still very imperfectly acquainted with the birds of these two islands, eleven out of the present list have been recorded as occurring in Martinique, and ten in Dominica. The species peculiar to Santa Lucia (so far as we know at present) are three in number—namely, *Cinclocerthia macrorhyncha*, *Icterus laudabilis*, and *Myiobius latirostris*.

2. ON a New Chinese Gull.

By ROBERT SWINHOE, F.Z.S.

[Received March 15, 1871.]

(Plate XXII.)

CHROICOCEPHALUS SAUNDERSI, n. sp. (Plate XXII.)

Gavia kittlitzii, Swinhoe, Ibis, 1860, p. 68, 1861, p. 345.

Chroicocephalus kittlitzii, Swinhoe, Ibis, 1863, p. 428; P. Z. S. 1863, p. 328.

Larus schimperi, Schlegel (*nec* Bonaparte), Mus. des Pays-Bas, *Lari*, p. 40.

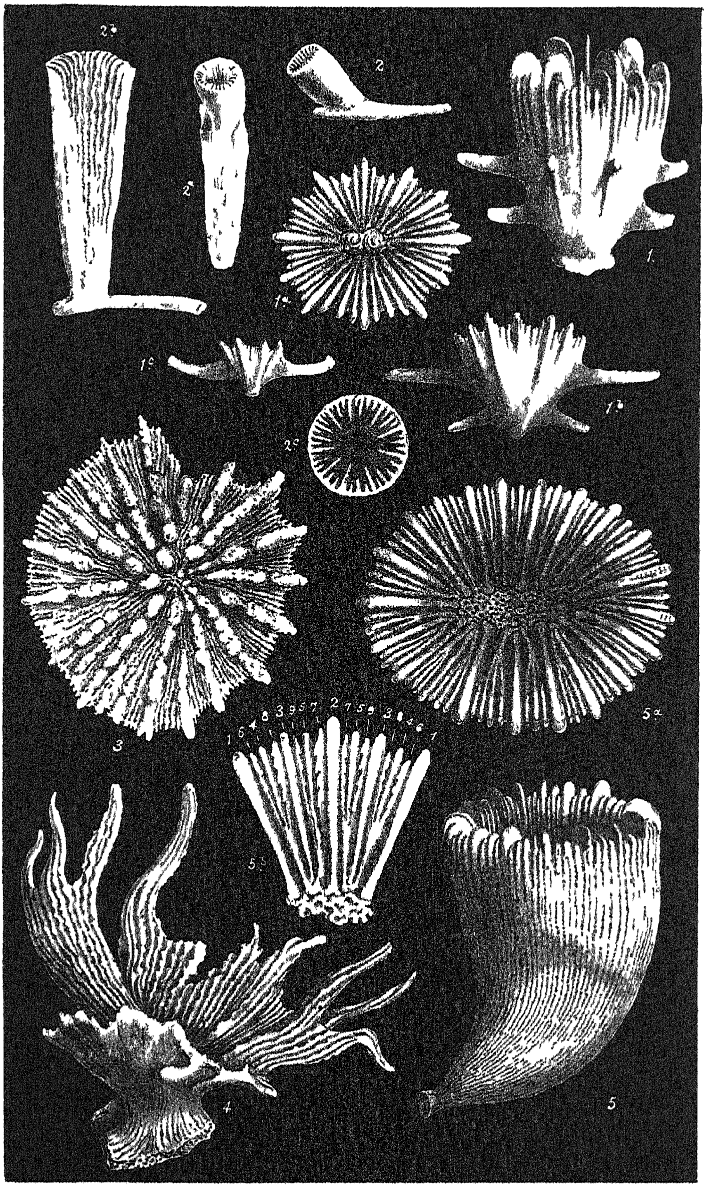
I have long supposed that the common Chinese River-Gull was referable to *Chroicocephalus kittlitzi* of Bruch, from the fact of its having been so identified by a well-known authority on Birds. Prof. Schlegel did not agree with this identification, and has referred it to *L. schimperi*, Bp., of New Zealand. I have thus been led to turn to Dr. Bruch's "Monograph of the Genus *Larus*," published in the 'Journal für Ornithologie,' 1853; and there I find that the *C. kittlitzii*, Bruch (p. 104), is founded on the drawing of a bird from South Chili, preserved at St. Petersburg. The description of this species by no means answers to our bird, nor does that of *C. schimperi*, Bp., the bills of both being "fine red." I cannot, therefore, but consider our bird an undescribed species, and have much pleasure in dedicating it to Mr. Howard Saunders, who is making a special study of the Laridæ. Our bird is remarkable for having a high *black* bill at all stages of plumage and at all seasons.

(1) *Adult* ♂, *with hood* (shot 23rd of February, 1858). Bill and eyelids black; inside of mouth vermilion. Legs tile-red, with black claws. Irides black. Entire head to nape bronzed black, with an incomplete white eye-ring. Broad collar, upper tail-coverts, tail, underparts, and axillaries near the edge of wing pure white (no rosiness). Mantle, wing-coverts, and tertiaries pearl-grey. Outer quill white, edged with black for nearly half its basal length, and with the inner web marked obliquely with black on its basal half, leaving a white border to the shaft, which expands forwards; second quill with the oblique black advancing nearer the tip, and a black band on the inner web near the tip; third and fourth with greater part of the inner web black, a black band near the tip, and a slight black edging to the outer web; the fifth and following feathers are light grey, the fifth having a black border to its inner web and a half band near its tip, the sixth only a partial black edging to the inner web. Outer edge of wing white. Axillaries and under wing-coverts light grey.

(2) *Adult* ♂ (shot 19th of November, 1867). Without hood, but a few black feathers still remaining on the head. Bill and eyelid black; irides deep brown. Legs deep tile-red. Length 13·5 inches; wing 10·75, reaching 2·25 beyond tail. Bare tibia ·8, tarse 1·7; middle toe 1·15, its claw ·25. Bill, forehead to tip 1·1, lower mandible to gape 1·7; depth of bill at angle of gonys ·4. Tail of twelve feathers, nearly equal, the two centrals and the outer one ·2 longer than the rest; length of tail 4·5.

(3) *Adult* ♀, *without hood* (shot 26th of January, 1857). Bill and irides black. Inside of mouth vermilion. Legs dark indian-red; claws black. Head white, with a little dark grey on the occiput, a black edge to the fore part of the eyelids, and a black spot on the ear. The second to fifth primaries with a black band near the white tip. Otherwise as in (1). Length 13; wing 11·5, expanse 33 inches.

(4) *Bird not fully mature* (shot December 1867). A few brown feathers of immaturity still remain on the shoulders and among the tertiaries. The occiput is deeper grey, the white collar is tinged with the grey of the back, the tail is slightly tipped with brown, and

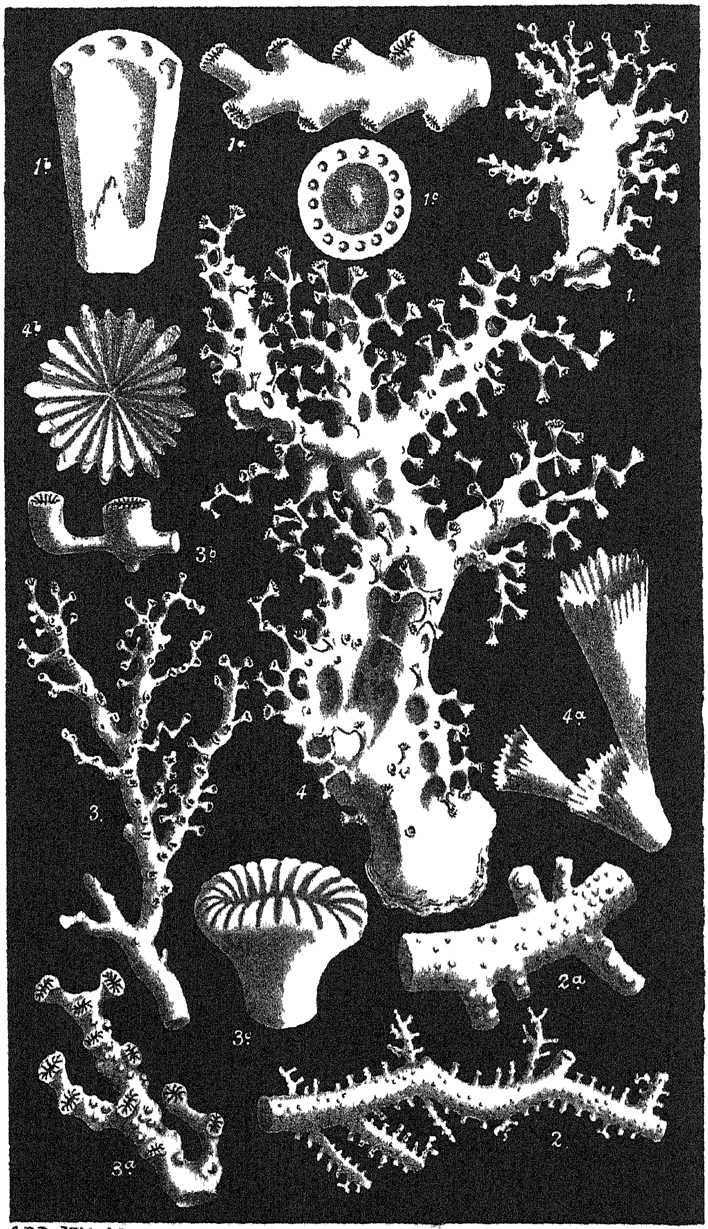


G R De Wilde lith

W West & Cº imp

New Madrepores

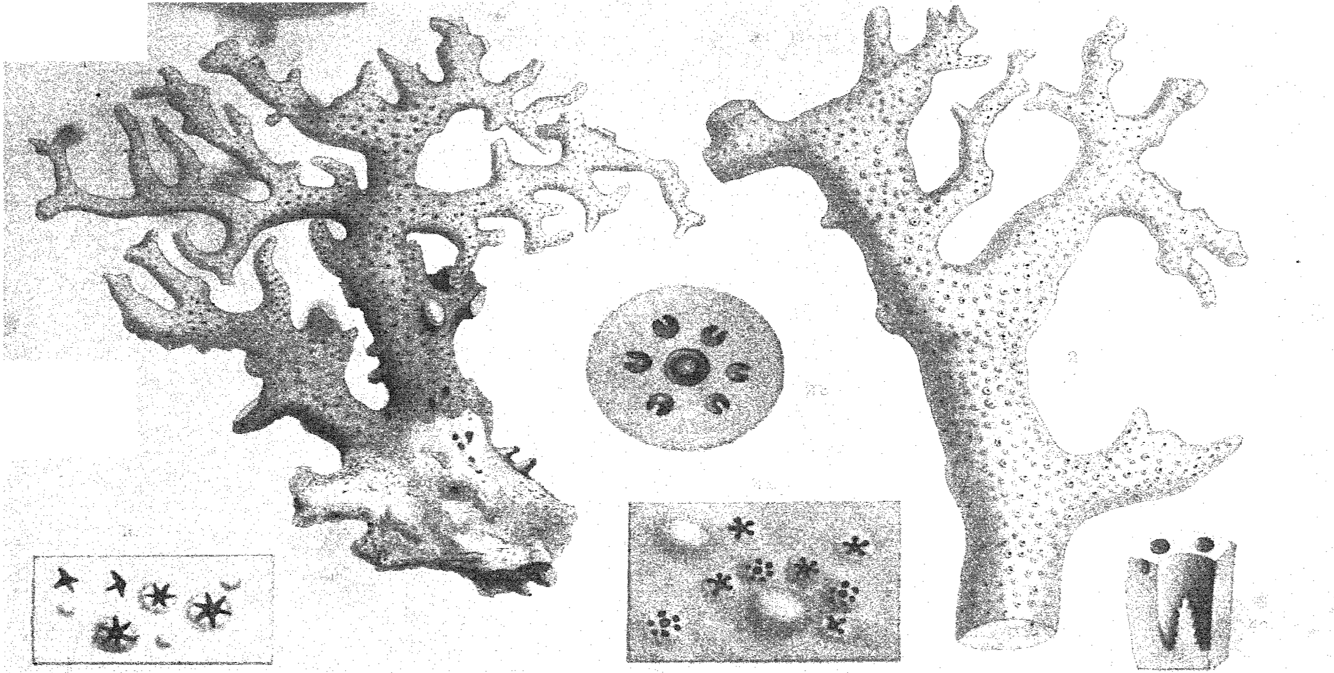
P. Z. S. 1871. Pl. XXIV.



G. R. De Wilde lith.

W. West & Co. imp.

New Madrepores.



Mintern Bros imp.

New Madrepores.

the quills are more marked with black. The first four quills are edged outwardly and tipped with black, their inner webs being for the most part of that colour; the fifth to seventh less so by degrees, with the white tip, not visible on the first and second, gradually increasing in size. Bill black. Feet dark brownish red.

This species is very common during winter at Amoy, ascending the river in large parties at fall of tide, and pouncing on small fish and crustaceans left exposed by the receding water.

April 4, 1871.

Robert Hudson, Esq., F.R.S., V.P., in the Chair.

The following papers were read:—

1. On some new and little-known Species of Madrepores, or Stony Corals, in the-British Museum Collection. By W. Saville Kent, F.Z.S., F.R.M.S., of the Geological Department, British Museum.

[Received March 18, 1871.]

(Plates XXIII.–XXV.)

Last year while engaged in arranging, naming, and preparing a Catalogue of the Stony Corals contained in the National Collection, numerous new and little-known forms fell beneath my notice, some of which, with Dr. Gray's kind permission, I shall now proceed to describe.

Section APOROSA.

Family Turbinolidæ.

Acanthocyathus spiniger, n. sp. (Plate XXIII. figs. 1, 1 *a*, *b*, *c*.)

Corallum turbinate, straight, slightly compressed; attached when young. Calice oval, the lateral extremities somewhat angular, its fossa deep. Primary and secondary costæ very prominent, the former conspicuous from the base, and each bearing spinous prolongations, those situated on the two lateral costæ the most developed. Septa 48 in number, forming four complete cycles, much exsert, more especially the primaries; their lateral surfaces granulate, their internal edge slightly flexuous. Columella elongate, formed of two or three twisted lamellæ. Pali slender, twelve in number, situated opposite the septa of the third septal cycle. External surface of the the theca finely granulate.

Hab. Japan. B.M.

This species differs from *Acanthocyathus grayi* (M.-Edw.), the only recorded existing form, in the straight instead of curved contour of its corallum, in its prominent costæ bearing spinous processes on others besides the two lateral primary ones, and in its more particularly exsert primary septa.

Its costal peculiarities seem to demonstrate its being more closely allied to *A. hastingsæ* (M.-Edw.), a species occurring as a fossil in the Miocene deposits of Malta.

Figs. 1 *b* and 1 *c* of Plate XXIII. illustrate various stages of development of *A. spiniger*; the extra spines present in fig. 1 appear to be characteristic of the adult condition. Though all the specimens examined are free, each exhibits traces of an early attachment.

FLABELLUM MATRICIDUM, n. sp. (Plate XXIII. figs. 2, 2 *a*, *b*, *c*.)

Corallum elongate, almost cylindrical, attached by its base. Calicular fossa circular, very deep. Theca exceedingly slender, invested by a complete epitheca. Septal cycles four in number, the last cycle incomplete. Primary and secondary septa scarcely exsert; lateral surfaces of septa granulate, their inner edge delicately flexuous above, thickened inferiorly, and becoming lost in the trabecular elements of the rudimentary columella. Costæ even, distinct throughout.

Hab. Japan. B.M.

The mode of increase in this species is exceedingly remarkable, resulting from internal gemmation at the expense of the parent calyx in the following manner:—The adult condition being arrived at, a bud makes its appearance immediately within the margin of the calyx, and, rapidly increasing in size, becomes confined by the opposite wall of the parent; this, owing to its tenuity and the pressure exerted upon it, fractures and falls to pieces, the young bud still remaining attached to the portion from which it originated.

Family OCULINIDÆ.

AMPHIHELIA INFUNDIBULIFERA, nobis. (Plate XXIV. figs. 4, 4 *a*, *b*.)

O. *ramosissima, subflabellata; ramulis ultimis minimis flexuosis; stellis infundibuliformibus, interne striatis; margine crenulato.*

Oculina infundibulifera, Lamarck, Hist. des Anim. sans Vertèb. p. 286, 1816.

Allopora (*Stylaster*) *infundibulifera*, M.-Edw. Hist. des Corall. t. ii. p. 131, 1857.

Specimens in the British Museum, collected at Formosa by Consul Swinhoe, are evidently identical with the species described as above by Lamarck; but the entire absence of a columella and the unequal development of the septal cycles preclude its being referred to the group of the Stylasteraceæ, as proposed by Milne-Edwards. These characters, when added to the alternate distal mode of increase of the calices, and the remarkable development of the basal cœnenchyma, indicate its true position among the representatives of the genus *Amphihelia* of the same author, to which genus I here refer it while proposing the following more exhaustive specific diagnosis:—

Corallum arborescent, irregularly branching, subflabellate. Cœnenchyma faintly striate, frequently coalescing, somewhat fistulose; greatly developed in the trunk and main branches, but almost entirely wanting in the ultimate ramifications. Calices infundibuliform, increasing by alternate distal gemmation, two gemmæ, however, occasionally springing, as in *Cyathohelia*, opposite each other from the margin of the same calice. Septa 24 in number, forming three complete cycles; the primaries more exsert than the secondaries, and the latter slightly more so than the tertiaries, projecting but little into the calicular fossa, to which they consequently give the "internal striate" appearance observed by Lamarck. Costæ only visible superiorly. Height of corallum several inches. Diameter of calices $\frac{1}{12}$ inch.

Hab. Formosa, Indian seas. B.M.

STENOHELIA MADERENSIS, nobis. (Plate XXIV. figs. 3, 3 *a*, *b*, *c*.)

Allopora maderensis, J. Y. Johnston, Proc. Zool. Soc. 1862, p. 196, figs. 1, 2, 3.

Stenohelia maderensis, W. S. Kent, Ann. & Mag. Nat. Hist. v. p. 120, 1870.

I avail myself of the opportunity of giving here an illustration of this interesting species, first introduced by Mr. Johnston, but whose characters and structure are by no means satisfactorily explained or displayed in the description and figures accompanying his communication.

Since the publication of my paper above quoted, in which I make this form the type of a new genus, I have, through the kind courtesy of Prof. Du Bocage, examined additional specimens belonging to this same species contained in the Lisbon-Museum collection, obtained from the Cape-Verde Islands, and having the ampullæ, present in the British-Museum example, still more highly developed. A fragment in illustration of this is represented at Plate XXIV. fig. 3 *a*.

STYLASTER AMPHIHELOIDES, n. sp. (Plate XXIV. figs. 1, 1 *a*, *b*, *c*.)

Corallum branching, subflabellate; basal cœnenchyma often fistulose and coalescing, its surface smooth. Calices increasing by alternate distal gemmation; calicular fossa deep. Columella styliform, echinate, deeply immersed. Septa even, twelve to sixteen in number, projecting but little into the calicular fossa, often coalescing laterally, and so forming an inner tube, and giving the interseptal chambers a punctate appearance, as in *S. erubescens* (Pourtales) and various species of *Allopora*. Ampullæ rudimentary, represented by a few raised points scattered irregularly over the surface of the cœnenchyma, but more particularly in the neighbourhood of the ultimate ramifications.

Height of corallum one or two inches; diameter of the calices $\frac{1}{16}$ inch.

Hab. Cape of Good Hope. B.M.

I had premised that this species might possibly prove to be identical with *Allopora bella* (Dana); but Count de Pourtales, who is familiar with the type examples of that form, assured me, during his recent visit to England, of its distinctness. In the character of its basal cœnenchyma it closely resembles the genus *Amphihelia.*

Verrill has proposed to make this *Allopora bella* the type of a new genus, bestowing upon it the name of *Cyclopora* ("Synopsis of Corals &c. of North Pacific Exploring Expedition," Proc. Essex Institute, July 1866). He considers it to be intermediate between the genera *Stylaster* and *Distichopora* in the structure of its septal system, which assumes that "pit-like" character dominant in *Distichopora,* and common to both *Stylaster* and *Allopora.* The remaining characters agreeing entirely with those of *Stylaster,* it cannot be naturally separated from that genus.

STYLASTER ASPER, n. sp. (Plate XXIV. figs. 2, 2 *a.*)

Corallum arborescent, flabellate; surface of the cœnenchyma finely echinate throughout, the minor ramuscules often springing from the preceding ones in a regular pinnate order. Calices very minute, increasing by alternate distal gemmation. Columella immersed, stylate, echinate. Septa about twelve in number. Ampullæ conspicuous, hemispherical, sometimes echinate, solitary or in clusters, scattered principally over the cœnenchyma of the secondary branches.

Height of corallum several inches; diameter of the calices $\frac{1}{23}$ inch, of the ampullæ $\frac{1}{20}$ inch. Colour pale pink.

Hab. Unrecorded. B.M.

This species most nearly approaches *Stylaster sanguineus,* but is distinguished from it by its echinate cœnenchyma, and by the minute size of its calices. In this last character it most closely approaches *S. gracilis.*

STYLASTER EXIMIUS, nobis.

S. elegans, Michelotti, Suppl. au Mém. sur les Corall. des Antilles, Mem. della Reale Acad. d. Scienze di Torino, tom. xxiii. p. 162, pl. ix. fig. 4, 1866.

Elegans having been already employed as a specific name for a representative of the same genus by A. E. Verrill, in 1863 (Bulletin Mus. Comp. Zool.), *eximius* is here proposed in substitution to distinguish the form more recently described by Michelotti.

ALLOPORA, Ehr.

This genus is characterized by Milne-Edwards, in his 'Histoire des Coralliaires,' as differing from *Stylaster* in its irregular mode of gemmation, and in the complete absence of "ampullæ," or vesicular inflations of the cœnenchyma; at the same time he expresses doubts whether the characters given may prove sufficient for the recognition of two distinct genera on other species becoming known. *A. oculata* (Ehr.) was the single form referred to the genus *Allopora* by Milne-Edwards in his work just quoted. Recently Count de Pourtales has discovered a second species, off the coast of Florida, which he describes in the Bulletin of the Museum of Comparative Zoology, Cambridge, U. S. for 1868, under the name of *Allopora miniata*; and my examination of the collection in the British Museum has resulted in my detecting three other distinct and undescribed species, undoubtedly referable to this same genus.

The mass of evidence now accumulated demonstrates that *Allopora* and *Stylaster* constitute two natural and easily defined genera. The character of the presence or absence of ampullæ, however, as shown in the following description of *A. explanata*, is not trustworthy even for the purpose of making specific distinctions. The whole and great difference must be based on their widely separated mode of development or gemmation, which is easily recognized on reference to figs. 1 *a* and 2 *a* of Pl. XXV., and fig. 1 *a* of Pl. XXIV. accompanying this communication.

In *Allopora* the corallum is aborescent, more or less massive, and has the calices distributed irregularly throughout its surface, this last character being likewise applicable to the mode of their first appearance at the extremities of the branchlets. In *Stylaster* the corallum is wanting in that massive and robust mode of growth characteristic of *Allopora*, and the gemmation is invariably alternate distal, as in *Amphihelia*, *Lophohelia*, and other Oculinidæ, and which, though sometimes disguised by the increase of the cœnenchyma in the basal portions of the corallum, is always apparent at the growing termination. Even in the former parts the peculiar primary mode of gemmation is betrayed by the more or less regular disposition of the calices in a linear series on either side, rendered sessile by the outgrowth of the cœnenchyma. This distinction makes easy our appreciation of the, at first sight, somewhat obscure characters of the form referred to the genus *Allopora* by Dr. Duncan, to be presently referred to. In *Allopora* this latero-linear distribution of the calices is altogether absent.

ALLOPORA NOBILIS, n. sp.

Corallum arborescent, the main stem and branches very massive, slightly flattened; the branchlets subflabellate, thick, terminating obtusely. Surface of the cœnenchyma smooth to the unassisted eye, but presenting a delicate shagreened appearance when examined with the pocket-lens. Calices densely distributed throughout the surface of the corallum, slightly prominent; very minute, scarcely exceeding one-third of a line in diameter. Septa varying in number from three to seven, more usually six; their inner edges joining laterally a little below the entrance to the calice, and forming minute pit-like interseptal chambers, within each of which, as in *Stylaster erubescens* (Pourtales), is enclosed a vertical fringe of small points resembling hairs. Columella deeply immersed, cylindrical, its apex pointed. Colour of the trunk and main branches dull rose, lessening still more in intensity towards the branchlets, the ultimate ramifications of which are nearly white. No ampullæ detected on the single specimen observed.

Hab. Unrecorded. B.M.

The unique specimen above described measures nearly a foot in height and nine inches in breadth, while the diameter of the most massive portion of the stem exceeds two inches, dimensions greatly surpassing those of any hitherto recorded representative of the Stylasteraceæ. Both this and the species next introduced appear to be closely allied to *Allopora miniata* (Pourtales); but in this last form the calices are larger, are distributed on one surface only of the branches, and become entirely obsolete on the main stem.

ALLOPORA EXPLANATA, n. sp. (Plate XXV. figs. 2, 2 *a*, *b*, *c*.)

Corallum branching, flabellate; the main stem and branches massive, slightly flattened; the branchlets attenuate. Surface of the cœnenchyma shagreened as in the preceding species. Calices prominent, distributed with moderate density throughout the corallum; half a line in diameter. Septal system very irregular, the septa being sometimes entirely wanting, or varying in number from one or two to as many as six or seven; when present frequently meeting within the margin of the calice, and enclosing a vertical fringe of points, as in *Allopora nobilis*. Columella deeply immersed, cylindrical, echinate, its apex pointed. Height and breadth of corallum five or six inches; diameter of the main trunk three-quarters of an inch. Colour of the surface of the sclerenchyma closely resembling that of the species last described, but of a still brighter hue; the distal extremities of the branchlets alone are yellowish white. Ampullæ present or absent.

Hab. Unrecorded. B.M.

As a species this form differs from *A. nobilis* in the flabellate mode of growth of its corallum, in the more rudimentary development of the septal system, and in the more widely scattered calices.

Of the two examples in the British-Museum collection, the one has large, smooth, vesicular ampullæ, nearly a line in diameter, distributed amongst the calices of the branchlets and younger branches, while in the other a few slight and very minute prominences are the only visible traces of these excrescent structures, illustrating what little dependence is to be attached to them even for the purpose of specific comparison.

ALLOPORA SUBVIOLACEA, n. sp. (Plate XXV. figs. 1, 1 *a*.)

Corallum branching, flabellate; the main stem and branches massive, compressed. Surface of the cœnenchyma less delicately shagreened than in *A. nobilis* and *explanata*. Calices slightly prominent, scattered throughout the surface of the corallum. Septa varying in number from three or four to as many as eleven (two cycles almost complete); never coalescing laterally, and forming pit-like interseptal chambers, as in the preceding species. Columella deeply immersed, cylindrical, echinate, its apex pointed. Surface of the main stem and the origins of the branches delicate rose-madder, the ultimate ramifications almost white. Length and breadth of entire corallum of the single specimen examined three and a half inches; diameter of the main stem half an inch, of the calices half a line. Ampullæ rudimentary, in the form of minute vesiculæ, distributed among the calices throughout the branches, though in greatest profusion towards their distal extremities.

Hab. Unrecorded. Sir E. Belcher's Collection. B.M.

The form referred to this genus as *A. oculata* by Dr. P. M. Duncan, in his description of the 'Porcupine' Expedition (Madreporaria, Proc. Roy. Soc. p. 295, 1870), is a true *Stylaster*, closely allied to *S. gemmascens* (M.-Edw.), *Madrepora gemmascens*, Esper (Pflanzenthiere, t. i. pl. 55, 1797), inhabiting the Indian seas. The gemmation in this species, though at first sight apparently irregular, is, on close examination, found to exhibit the alternate distal terminal gemmation and more or less attendant latero-linear arrangement of the calices on the main branches characteristic of *Stylaster*. Some time back Dr. Duncan kindly favoured me with a small specimen of this interesting coral, and since then he has permitted me to examine the whole series collected; but it being the property of the above expedition, I leave it to him to furnish the name and specific diagnosis.

Comparison with the figures of *A. oculata* in the 'Annales des Sciences Naturelles,' tom. xiii. pl. 4. fig. 4, 1850, shows that this species possesses altogether different characters.

DISTICHOPORA ROSEA, n. sp.

Corallum arborescent, branches nearly cylindrical. Calices occupying deep and occasionally irregularly interrupted lateral furrows; margins of the furrows very prominent. Columella attenuate, stylate, echinate, very deeply immersed, made visible by fracture of the corallum. Height of corallum one or two inches; diameter of the calicinal furrows $\frac{1}{20}$ inch, of the branches $\frac{1}{4}$ inch. Colour of the cœnenchyma bright rose-pink.

Hab. East coast of Australia. B.M.

As already shown by Count de Pourtales, the structure of the calices in *Distichopora* is identical with what obtains in *Stylaster* and *Allopora*, with the exception that the calices are confluent. In this respect *Distichopora* bears much the same relation to the two genera just mentioned as *Lithophyllia* and *Dasyphyllia* do to *Mussa* and *Symphyllia* among the Astreidæ. In *Distichopora* isolated calices are occasionally met with; and it is then that their similarity to those of other Stylasteraceæ become most apparent. I must differ with Count de Pourtales in considering this genus to be more closely allied, individually, to *Stylaster* than to *Allopora*, the latero-linear disposition of the calices indicating their development from primary alternate distal rather than from an irregularly scattered gemmation.

ERRINA, Gray.

Millepora (pars), Esper, Pflanzenthiere, t. i. p. 106, 1797.

Errina, J. E. Gray, Proc. Zool. Soc. p. 85, 1835.

Non *Errina*, Pourtales, Bulletin Mus. Comp. Zool. Cambridge, U. S. p. 116, 1867.

The essential characters of this genus, with its natural affinities not having been very satisfactorily determined, the following, drawn up from the type specimens of *E. aspera* in the British Museum, is here proposed for its diagnosis.

Corallum branching, flabellate. Sclerenchyma compact. Surface of the cœnenchyma beset with nariform verrucæ, these most abundant towards the distal extremities of the branches. Calices pit-like, circular, for the most part scattered among and concealed by the prominent verrucæ. Septal system entirely absent or rudimentary. Columella immersed, stylate, and echinate, almost entirely filling the calicular fossa.

ERRINA ASPERA.

Millepora aspera, Esper, *l. c.* Millepora, pl. xviii. figs. 1–4.

Errina aspera, Gray, *l. c.* p. 85.

The characters above given are also diagnostic of the species. To this it may be added that the corallum attains a height and breadth of several inches, is opaque white or cream-coloured, and is met with in both the Mediterranean and northern European seas.

The ultimate ramifications are terete; the diameter of the calicular fossæ about $\frac{1}{50}$ inch.

The two forms referred to this genus by Pourtales as *E. cochleata* and *glabra* evidently belong to a distinct genus, as must also be said of the examples referred to it and described as *E. aspera* (Gray) by the same writer, contained in the Museum of Comparative Zoology, Cambridge, U. S. Count de Pourtales at once recognized this on my showing him the typical specimens; and a modified description of his new species will shortly appear.

Errina proper, on account of its compact sclerenchyma and the form of its columella, is clearly referable to the group of the Stylasteraceæ, while in its irregular gemmation it most nearly approaches the genus *Allopora*. Connected with this mode of increase, however, there is a feature not observable in the last-named genus: instead of being simply terminal, gemmation also frequently occurs on the older portions of the corallum, young calices making their appearance on the surface of the out-growing cœnenchyma.

The rudimentary condition, or it may be said the entire absence of any recognizable septal system or intermesenteric calcifications, is the full development of a feature observed as exceptional in describing *Allopora explanata*. The very minute size of the calices at once suggests that septal elements would be of but little service in the economy of the individual polypes.

The prominent nariform and almost tubular verrucæ have, as is not to be wondered at, been mistaken by early writers for the orifices of the polype-cells, and in miniature they bear a certain resemblance to the nariform calices of various species of *Madrepora*; their true relationship, however, is probably identical with the many-patterned intercalicinal developments peculiar to the genera *Montipora* and *Stylocœnia*.

Subfamily STYLOPHORINÆ.

PENTALOPHORA, n. gen.

Reussia, Michelotti, Mém. sur les Corall. des Antilles, p. 63, 1860.

This new generic name is proposed in substitution for that of *Reussia*, in consequence of the latter having been used by Presl in 1838 to distinguish a genus of fossil ferns.

The single species referable to this genus, *Reussia lamellosa* (Mich.), is remarkable for its septal system being composed of a multiple of five, each calice being furnished with ten evenly developed septa, which are united internally to the stylate columella. The constant quintuple arrangement of the septal elements isolates this form from all known Madreporaria; in other respects it is closely allied to the genus *Stylopora*.

Family ASTREIDÆ.

TRIDACOPHYLLIA ALCICORNIS, n. sp. (Plate XXIII. fig. 4.)

Corallum slender, elevated; margins of thecæ produced into elkhorn-like prolongations. Columella absent. Septa forming three or four cycles, their internal edge dentate or lacinate, their lateral surfaces granulate. Costæ prominent, echinate. Epitheca rudimentary; endothecal dissepiments little developed.

Hab. San Cristoval, Solomon Islands. B.M.

This species differs from those previously described in the branching instead of foliaceous character of the walls of the thecæ.

TRIDACOPHYLLIA ECHINATA, n. sp. (Plate XXIII. fig. 3.)

Corallum infundibuliform, foliaceous; margins of thecæ bidentate, little elevated. Columella moderately developed, trabecular. Septa forming four or five cycles; the primaries and secondaries prominent and equally developed, having their internal edge remarkably thickened, coarsely tuberculate and echinate; the remaining septa little developed, denticulate or slightly echinate. Costæ not prominent, almost even, finely granulate. Epitheca moderately developed. Endothecal dissepiments of large size at the base of the corallum.

Hab. San Cristoval, Solomon Islands. B.M.

This species is at once recognized by the anomalous character of the primary and secondary septa.

OXYPORA*, gen. nov.

This name is proposed in place of *Trachypora* of A. E. Verrill

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* ὀξύς, sharp, cutting.

(Bulletin Mus. Comp. Zoology, Cambridge, U. S. p. 53, 1863), which has been already adopted by Milne-Edwards for a genus of the Cyathophylliidæ. He separates it from *Echinopora* on account of the echinate and coarsely costate character of the lower surface of the corallum. *T. lacera* and *aspera*, Verrill, are the species referable to this genus.

Family FUNGIDÆ.

LEPTOSERIS STRIATUS, n. sp.

Corallum suborbicular, explanate and undulate, slightly revolute. Calices remotely scattered; the excentral ones slightly elevated. Columella rudimentary. Septa evenly developed, not prominent, rather thickened; their external edge subentire, their lateral surfaces granulate, for the most part continuous from the centre of the calice to the margin of the corallum, to the whole surface of which they give a waved and striate aspect. Inferior surface evenly and finely costulate. Diameter of the corallum 2 inches, of the central calice $\frac{1}{8}$ inch.

Hab. Borneo. Collected by Sir E. Belcher. B.M.

This form differs from the species hitherto described in the explanate and slightly convex instead of infundibulate contour of its corallum, as also in its evenly developed septa and in its exceedingly sparsely scattered calicinal centres.

Section PERFORATA.

Family MADREPORIDÆ.

BALANOPHYLLIA IMPERIALIS, n. sp. (Plate XXIII. figs. 5, 5 *a*, *b*.)

Corallum curved, slightly compressed, attached by a slender base. Calicinal fossa elliptical, very deep. Columella well developed, trabecular. Septa forming five complete cycles, much exsert, more particularly those of the first three orders, which are of almost equal size, and have their inner edge entire and their lateral surfaces granulate; those forming the first and second orders entirely equal, and having their internal edge thickened in the vicinity of the columella, as in *Endopachys*. The internal edge of the septa of the fourth and fifth cycles lacinulate, more especially those of the fifth.

Septa of the sixth and eighth, and seventh and ninth orders coalescing with those of the fourth and fifth, and continuous to the columella in the form of a single septum. Costæ stout, conspicuous from the base to the margin of the calice, their surface echinate; united laterally by coarse trabeculæ. No epitheca. Height of corallum nearly 2 inches; longer diameter $1\frac{1}{30}$ inch, of the shorter one $\frac{3}{4}$ inch.

Hab. Singapore. B.M.

This species surpasses in size and in the beauty and symmetry of its internal structure any representative of the genus yet recorded *.

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* Through an accident one of the septal systems in the specimen figured has become slightly distorted.

BALANOPHYLLIA MALACCENSIS, n. sp.

This form closely resembles *B. floridana* (Pourtales), but may be distinguished by its well-developed and spongious instead of papillose columella, and by the freedom from granulation of the lateral surfaces of the septa.

Hab. Malacca. B.M.

TURBINARIA PARVISTELLA, n. sp.

Corallum massive, convex. Cœnenchyma abundant, very porous. Calices small, superficial, their apertures even with the surface of the cœnenchyma, not exceeding a line in diameter. Columella well developed, spongious. Septa of equal size, varying from twelve to eighteen in number.

Described from a specimen in the Oxford Museum, and of which a small fragment has been placed in the National Collection.

Hab. Unrecorded.

The non-prominent calices isolate this species from those hitherto described, and would seem to separate it from the genus *Turbinaria* of Milne-Edwards, which he characterizes as possessing prominent calices. In *T. cinerascens*, however, it frequently occurs that while the greater portion of the calices project considerably, the remainder are on a level with the surface of the cœnenchyma; and hence the character quoted, though dominant, cannot be considered essentially diagnostic of the genus.

Turbinaria parvistella in the massive form and yet extremely porous texture of its corallum, and in the entirely sessile character of its calices, shows its affinity to the genus *Astreopora*, from which it differs only in the possession of a well-developed columella.

EXPLANATION OF THE PLATES.

PLATE XXIII.

Fig. 1. *Acanthocyathus spiniger*, enlarged 2 diameters, showing the spinous prolongations of the primary costæ.

1 *a*. The same from above, illustrating the interior of the calice.

1 *b*, *c*. Early conditions of the same form.

2 & 2 *a*. *Flabellum matricidum*. Two young specimens, nat. size, showing their mode of gemmation from the parent calice.

2 *b*. Longitudinal section of an adult example of the same coral, enlarged 2 diameters, exhibiting the septal arrangement and the rudimentary condition of the columella, a portion of the parent calice still remaining attached.

2 *c*. A calice of the same species viewed superiorly.

3. *Tridacophyllia echinata*. Corallum, nat. size, viewed from above.

4. *Tridacophyllia alcicornis*, nat. size, viewed laterally.

5. *Balanophyllia imperialis*, nat. size, lateral aspect.

5 *a*. Calice of the same, from above, enlarged 1½ diameter.

5 *b*. Diagrammatic illustration of a single system of the same coral, showing the relationship and arrangement of the septal elements.

PLATE XXIV.

Fig. 1. *Stylaster amphiheloides*, nat. size.

1 *a*. A small ramuscule of the same, magnified 3 diameters, and illustrating the alternate distal mode of gemmation.

Fig. 1 *b*. A single calice, fractured longitudinally, and exposing the deeply immersed and echinate columella, × 16 diameters.
1 *c*. A calice viewed from above, displaying the "pit-like" interseptal chambers produced by the lateral coalescence of the septa.
2. *Stylaster asper*, nat. size.
2 *a*. Portion of a branchlet, enlarged 4 diameters, and exhibiting the thickly scattered ampullæ.
3. *Stenohelia maderensis*, nat. size. Specimen from Madeira.
3 *a*. A small branch of an example from the Cape-Verde Islands, exhibiting thickly scattered "ampullæ." × 2½ diameters.
3 *b*. Two terminal calices from the Madeiran example, viewed laterally, and showing an ampulla on the lower surface of the proximal one. × 5 diameters.
3 *c*. A calice viewed from above, showing the tendency of the lower edge to encroach upon and conceal the calicular fossa, a character which indicates its affinity with the genus *Cryptohelia*.
4. *Amphihelia infundibulifera*, nat. size.
4 *a*. Three calices, viewed laterally, × 6 diameters.
4 *b*. A calice viewed from above, illustrating the relative proportions of the septal elements. This figure is diagrammatic.

PLATE XXV.

Fig. 1. *Allopora subviolacea*, nat. size.
1 *a*. Portion of a branch with calices, × 5 diameters.
2. *Allopora explanata*, nat. size.
2 *a*. Portion of a branch bearing calices and ampullæ, × 5 diameters.
2 *b*. A single calice, × 25 diameters, exhibiting the pit-like interseptal chambers enclosing minute echinate secondary septa.
2 *c*. Portion of a calice in perpendicular section, displaying the stylate and echinate columella.

2. Notes on Indian Siluroid Fishes.

By Surgeon FRANCIS DAY, F.Z.S., F.L.S.

[Received March 20, 1871.]

Amongst variations in the form of certain organs in fishes, the air-vessel furnishes some remarkable examples. In the genus *Polynemus*, amongst the Acanthopterygians, one species, the *P. indicus*, possesses this organ and appendages of such a size that it is collected in India for the isinglass it furnishes; whilst the *P. tetradactylus* does not possess even the vestige of an air-vessel. The existence of this organ in the marine and estuary forms of the Siluroid family is of some consequence in a commercial point of view, as most of the isinglass or fish-sounds exported from India to China comes from this source. The extensive order Physostomata of Müller is chiefly based upon the existence of a communication between the air-vessel, when present, and the pharynx.

Having lately had the opportunity of examining many species of freshwater Siluroids, or those forms which ascend long distances from the sea, I have made the following observations as to the presence or absence of air-vessels, and also the form they assume. In the 'Proceedings of the Zoological Society' for 1869, p. 309, I commented upon the air-vessel of the *Gagata typus*, Bleeker; and it then occurred to me how few inquiries appeared to have been instituted respecting this matter amongst the Siluroid fishes of India, and that what had been made referred chiefly to the genera *Clarias, Plotosus, Saccobranchus, Wallago, Callichrous*, and *Arius.*

Genus EUTROPIICHTHYS.

In the *E. vacha*, Ham. Buch., the air-vessel is in the form of a tube rather enlarged at either extremity, its diameter being equal to about one-half of that of the vertebral column posterior to it. It closely embraces the body of the third vertebra, lying across it and the large vessels. It then curves backwards and upwards, in the first portion of which course it is slightly protected by a projection on the body of the second vertebra. In the last portion of its extent it is protected by a wide concave expansion of the lateral processes of the first and second vertebræ. This expanded portion of the vertebræ, in which the air-vessel lies, is about equal in width to that of the body of a vertebra.

Genus AILIA.

In the *A. bengaliensis*, Gray & Hard., the air-vessel is of the same description as in the *E. vacha*, with the exception that it is rather more dilated at either extremity.

I would here remark upon a curious specimen of this species, 6½ inches long, which I procured at Delhi. It has more or less distinct spines along the whole course of its back, most prominent midway between the eye and the base of the caudal fin.

Genus PSEUDEUTROPIUS.

In the *P. garua*, Ham. Buch., the air-vessel is contained in the abdominal cavity, but is small, somewhat heart-shaped, with a short prolongation on either side anteriorly. It is firmly attached to the anterior vertebræ, embracing their bodies, and being a little extended laterally on either side.

Genus PANGASIUS.

In the *P. buchanani*, Cuv. & Val., the air-vessel is contained in the abdominal cavity; it extends from opposite the base of the pectoral fin to as far as the end of the anal. A slight contraction exists between its anterior third and the remainder of the organ.

Genus SILUNDIA.

In the *S. gangetica*, Cuv. & Val., the air-vessel is also contained in the abdominal cavity. It is large, and with very thin walls.

Genus MACRONES.

In the *M. cavasius*, Ham. Buch., the air-vessel is contained in the abdominal cavity, but not loosely as in the *Pangasius*. It is of a round or oval form, situated in the anterior part of the abdomen, and resting against the almost horizontally expanded lateral processes of the first two vertebræ, to which it has also tendinous attachments.

MACRONES NANGRA, Ham. Buch.

D. $\frac{1}{8}|0$. P. $\frac{1}{9}$. V. 6. A. $\frac{2}{8}$. C. 17.

Length of head $\frac{2}{9}$, of caudal $\frac{2}{9}$, height of body $\frac{2}{11}$ of the total length.

Eyes rather high up, situated in the anterior half of the head, and $1\frac{1}{4}$ diameter from the end of the snout.

A wide and deep superior longitudinal furrow extends from the snout to the posterior end of the occipital process, which latter is above half longer than broad at its base. The basal bone of the dorsal fin is extended laterally as well as anteriorly, where it meets the occipital process, there being no separate interneural bone. The width of the head at the opercles equals its length.

Mouth wide, cleft shallow, the upper jaw much longer than the lower. Nasal barbels slightly longer than the head, the maxillary ones reach the vent, the external mandibular ones extend to the base of the ventral, the internal ones to the base of the pectoral.

Teeth villiform, in an uninterrupted crescentic band.

Fins. Dorsal spine weak, smooth, half as long as the head; pectoral spine moderately strong, nearly as long as the head without the snout, and having nine strong denticulations internally. Length of base of adipose dorsal equals the distance the fin commences from the termination of the base of the first dorsal, and is as long as that of the anal. Caudal deeply forked, lobes of equal length and pointed.

Colours. Muddy, slightly clouded in places.

Hab. Allahabad, in the Ganges, attaining $1\frac{1}{2}$ inch in length, and not uncommon.

Genus RITA.

In the *R. crucigera*, Owen (if differing from the *R. kuturnee*, Sykes, which appears doubtful), the air-vessel is in the abdominal cavity; it has a strong white tendinous covering, which sends down partitions subdividing it into three portions, the one being anterior, the other two posterior and lateral, whilst their walls are very thin.

Genus HEMIPIMELODUS.

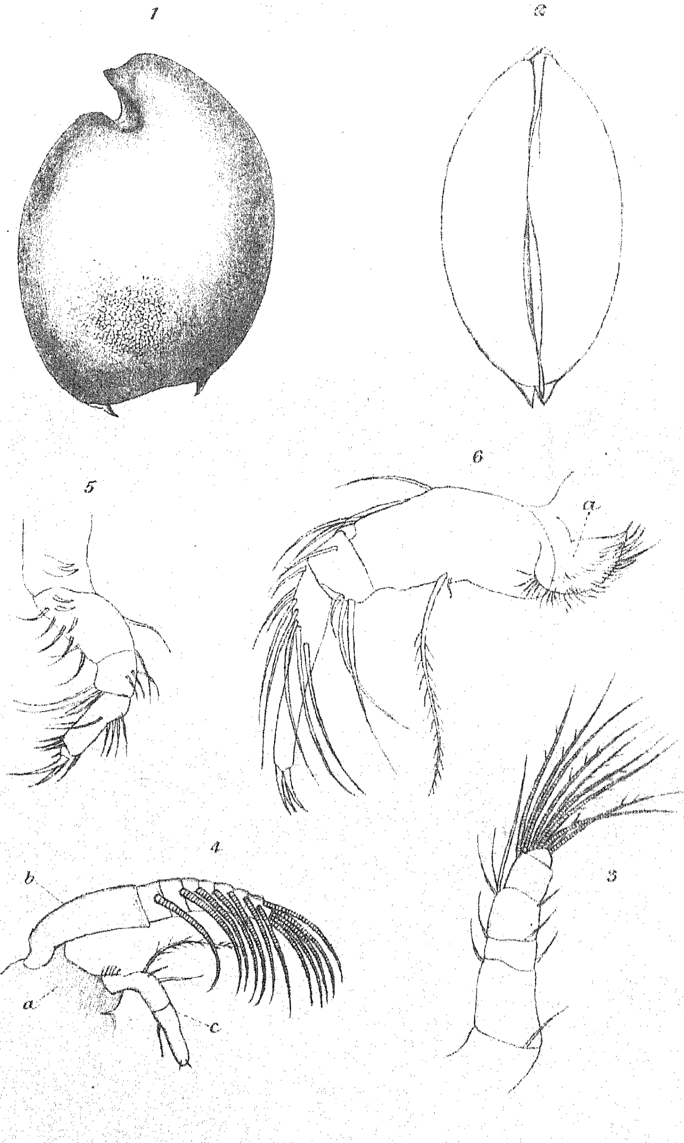
In the *H. cenia*, Ham. Buch., the air-vessel is laterally divided into two lobes and entirely enclosed in bone, as in the majority of the Loaches (*Cobitidina*).

GLYPTOSTERNUM TELCHITTA, H. Buch.

D. $\frac{1}{6}|0$. P. $\frac{1}{8}$. V. 6. A. $\frac{1}{10}$. C. 15.

Length of head $\frac{1}{5}$, of caudal above $\frac{1}{5}$, height of body $\frac{2}{13}$ of the total length.

Eyes small, situated in the commencement of the posterior half of the head.

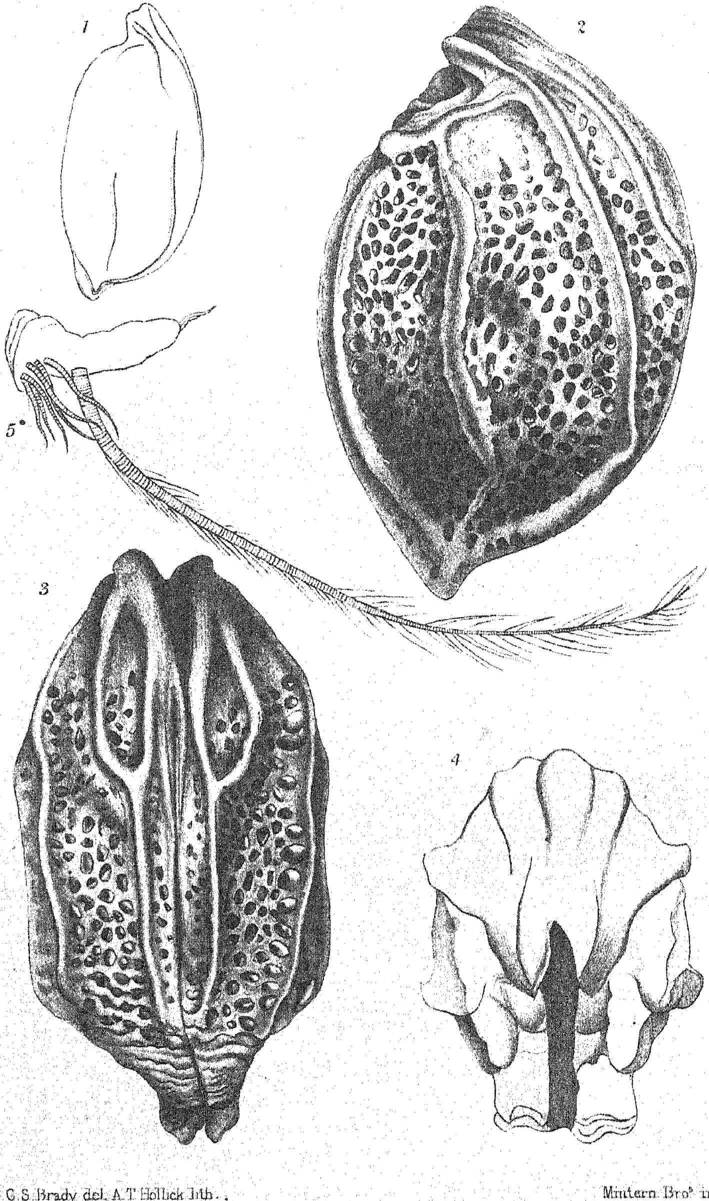


C.S.Brady del. A.T.Hollick lith.

Mintern Bros imp.

1–5 PHILOMEDES INTERPUNCTA ♀

6. BRADYCINETUS BRENDA ♂



G. S. Brady del. A. T. Hollick lith.

Mintern Bros imp

PHILOMEDES FOLINII.

Head longer than broad; occipital process three times as long as wide at its base. Free portion of tail twice as long as high. Thoracic adhesive apparatus lozenge-shaped.

Lips roughened, not fringed; maxillary barbels reach to below the posterior margin of the orbit, the nasal ones short, the outer mandibular pair do not reach the gill-opening, but they are longer than the internal mandibular pair.

Fins. Dorsal nearly as high as the body, its spine slender, its osseous portion being two-thirds as long as the head; base of adipose fin as long as that of the first dorsal, and equalling two-fifths of the distance between the two fins. Pectoral spine broad and strongly denticulated, extending two-thirds of the distance to the base of the ventral. Caudal deeply forked.

Air-bladder in two rounded lateral portions, very thin, and entirely enclosed by bone.

Colours. Blackish brown. Fins yellowish, with black bands. Caudal black, with yellow margins.

The *G. trilineatum*, Blyth, is distinct from this species, and apparently identical with that described by Dr. Gunther. The specimens in the Calcutta Museum do not appear to have comprised Mr. Blyth's typical example; but a *G. trilineatum* has lately been received from Rangoon.

3. A Review of the *Cypridinidæ* of the European Seas, with Description of a new Species. By GEORGE STEWARDSON BRADY, C.M.Z.S.

[Received March 29, 1871.]

(Plates XXVI. & XXVII.)

Dr. G. O. Sars, in a memoir published in 1869*, expressed his belief that two well-known Cypridinidæ, heretofore considered as belonging to entirely distinct genera, are in fact merely the male and female of the same species,—*Philomedes longicornis* (Lilljeborg) representing the male, and *Bradycinetus brenda* (Baird) the female. He also, in the same place, propounded a similar view as regards *Cypridina mariæ* (Baird) and *C. teres* (Norman). The latter proposition seemed to present no very great difficulty; but as regards the former several almost insurmountable obstacles presented themselves to my mind. Thus a male form of *Bradycinetus brenda*, quite distinct from *Philomedes longicornis*, and nearly approaching in shape to the female, had already been described by Sars himself; so that the new theory involved the supposition of two distinct males; then the structure and shape of the shell in *B. brenda* and *P. longicornis* are widely different; and, lastly, while (the male) *P. longi-*

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* Undersogelser over Christianiafiordens Dybvandsfauna anstillede paa en i Sommeren 1868 foretagen Zoologisk Reise.

cornis is at some seasons abundant on certain parts of the British coast, *B. brenda* has never been met with, except very sparingly, and in only two localities.

The following is a brief abstract of Sars's remarks on this subject:—"I had long remarked that all the individuals of *Philomedes longicornis* appeared to be males; there were no egg-bearing females; but it did not occur to me to look for the female in so different a form as *C. globosa* (*brenda*), especially as I had already found what appeared to be the male of that species. But we find in other Crustacea (*Apseudes anomalus* and certain Cumacea) two forms of males,—one and much the commoner form being very similar to the female, the other and scarcer differing in many important details, especially in the great development of the eyes and antennæ. The parts of the Cypridinidæ which appear to be least liable to alteration are the mandible-palp, the last pair of jaws, the ringed appendage ("oviferous foot"), and the postabdominal lamina; and these parts are all alike in *Cypridina globosa* and *Philomedes longicornis*. A further confirmation of the truth of my view is, that I have found a similarly formed male of a closely allied species, *P. lilljeborgii*. This differs from *P. longicornis* in having the postero-inferior spine of the shell more strongly developed, the ringed appendage showing also the same distinctive marks as does that of the female, in having only about nine spines instead of thirty as in *C. globosa*."

Among a number of Ostracoda dredged at various depths in the Fosse de Cap Breton (Bay of Biscay) by M. le Marquis de Folin, and sent to me for identification, were several specimens of a very remarkable undescribed species, one of which was so far different in size and form from the rest, though retaining the same characters as to shell-sculpture, that I immediately took it to be the male of the more abundant female form. And on further examination the smaller example proved to have all the anatomical characters of Lilljeborg's genus *Philomedes*, while the larger ones belonged to *Bradycinetus*, Sars. The shell-structure is here of so novel a type (no similar deep excavation and ribbing having heretofore been noticed among the Cypridinidæ) that I could no longer doubt as to the sexual relations of *Philomedes* and *Bradycinetus* in this instance; and I was therefore disposed to regard Sars's case as proved with respect also to *P. longicornis* and *B. brenda*. This conclusion, however, I had adopted too hastily, as will presently appear; for in the same gathering (Cap Breton) were found several examples of a *Philomedes* (Pl. XXVI. fig. 1) agreeing in general aspect with "*P. longicornis*," but rounder in lateral outline and more tumid, having also a reticulated shell-structure exactly the same as that of the common form, but differing constantly in the presence of two well-marked sharp spines on the postero-superior and postero-inferior angles of the shell. Anatomical investigation showed that this was in fact the true female of *P. longicornis*, the only appreciable differences consisting in the shortened filaments of the upper antennæ, and the smaller development of the eyes, mandibular feet, and secondary branch of lower antenna, the vermiform appendage and abdominal laminæ being the same in both sexes. The structure is, in fact, entirely that of a female *Bradycinetus*. Further, on examining a specimen of *Asterope grœnlandica*, Fischer, taken in the same locality, I found that its characters were those of a male *Bradycinetus*; and on comparison of the shell with that of *B. brenda*, the points of resemblance appear so striking that I entertain no doubt of its being the male of that species. And I may here mention that although Sars appears to have found the excessive spinous armature (spines nearly thirty in number) of the vermiform appendage of *B. brenda* reproduced in "*P. longicornis*," I have myself never been able to see more than eight or nine spines in the latter species; while in "*A. grœnlandica*" they number about thirty as in *B. brenda*. Adopting these views, the genera of European Cypridinidæ may be briefly characterized as follows:—

CYPRIDINA (M.-Edwards).

Shell smooth, thin, and flexible; notch shallow; its posterior extremity only slightly exserted. Superior antennæ seven-jointed; setæ of moderate length; natatory branch of inferior antenna nine-jointed, bearing moderately long setæ; secondary branch very small, subulate. Basal joint of mandibular feet bearing an entire subconical and densely hairy process; penultimate joint much elongated and beset on the interior margin with numerous ringed setæ; last joint very short and almost obsolete.

BRADYCINETUS (G. O. Sars).

Shell much denser than in *Cypridina*, punctate; notch deep. Superior antennæ six-jointed; the apical setæ of moderate length, subequal, rather longer in the male than in the female; inferior antennæ nearly as in *Cypridina*; length of joints nearly alike in both sexes; filaments very short in female, rather longer in male; secondary branch of the inferior antenna in the female biarticulate, very small, in the male larger and triarticulate. Mandibular feet in the female armed on the basal joint with a strong bifurcate process, in front of which are three toothed spines; in the male bearing on the basal joint a large densely setose triangular process, and having the last joint very much elongated; second pair of jaws having a strong mandibular appendage consisting of two robust tooth-like processes. Eyes of the female small and pale-coloured, of the male large, deep-red, and multilenticular.

PHILOMEDES (Lilljeborg).

Shell of moderate strength and density. Superior antennæ six-jointed; in the female short and thick, and bearing several subequal terminal setæ of moderate length; in the male more elongated, two of the terminal setæ of excessive length, the antepenultimate joint bearing a stout and densely setose auditory filament. Natatory branch of lower antennæ nine-jointed; in the female having the first joint very long, the rest short and subequal; in the male the first and third joints long, the second much shorter, the rest short and subequal: secondary branch in female indistinctly jointed, setose; in the male long, three-jointed, cheliform. Mandibular feet nearly alike in both sexes; in the female armed, as in the female *Bradycinetus*, with mandibuliform processes and spines, in the male bearing on the basal joint a small tubercle with two short hairs; second pair of jaws in the female armed with mandibuliform processes. Eyes as in *Bradycinetus*.

ASTEROPE * (Philippi).

Shell subcylindrical, beak not at all produced. Upper antennæ as in the preceding genus. Second joint of the natatory branch of the lower antennæ in the male elongated, in the female scarcely longer than the succeeding joints; secondary branch in the male robust, subchelate; terminal joint slender, curved upwards; in the female simple, triarticulate, last joint setiform. First maxilla consisting of a broad subquadrate or crescentic lamina, densely clothed on its distal margin with long bristles; second swollen at the base, narrowed at the apex, where it bears six plumose setæ, basal portion setose along its convex margin; third maxilla narrow, elongated, setose along the inner margin. Abdominal laminæ broad and short, subtruncate at the extremity.

1. CYPRIDINA NORVEGICA, Baird.

Hab. Norway, Shetland.

2. CYPRIDINA MESSINENSIS, Claus.

Hab. Mediterranean.

3. BRADYCINETUS BRENDA, Baird, sp. (Plate XXVI. fig. 6.)

Cypridina brenda, ♀, Baird, 1850.
Cypridina globosa, ♀, Lilljeborg, 1853.
Bradycinetus globosus, ♀, G. O. Sars, 1865.
Bradycinetus brenda, ♀, Brady, 1868.
Asterope grœnlandica, ♂, Fischer, 1854.

Two specimens of a form exactly conforming to Fischer's description of *Asterope grœnlandica* occurred in M. de Folin's dredgings from the Fosse de Cap Breton. The shell differs from that of the female *B. brenda* in being less tumid and slightly more angular in outline; it is also quite smooth and free from villosity. The swimming-filaments of the upper antennæ are a little longer than those of the female, and more decidedly plumose. There is also a stout auditory seta; the natatory branch of the lower antenna is nearly alike in both sexes, but the secondary branch in the male is largely developed and triarticulate. The mandibular foot is much elongated (Plate XXVI. fig. 6), and bears on its basal portion a large and strong triangular densely setose process. The vermicular appendage* and abdominal lamina are precisely as in the female.

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* This genus might perhaps with more propriety (on account of the widely different structure of the maxillæ) be made the type of a distinct family. It is identical with *Cylindroleberis* (Brady), a fact of which I was not aware when that name was proposed.

Hab. Greenland (♂ & ♀), Shetland (♀), Norway, North Sea off Northumberland coast (♀), Bay of Biscay (♂).

I think there can be little doubt, from anatomical characters taken together with the agreement in shell-form, that Fischer's species is simply the male of the better-known form; the exactly similar spinous armature of the vermicular appendage is very striking, so large a number as twenty-eight or thirty spines being met with, as I believe, in no other instance.

4. **BRADYCINETUS MACANDREI**, Baird, sp.

Cypridina macandrei, Baird, 1850.
Bradycinetus macandrei, Brady, 1868.
Hab. North Atlantic, west of Scotland.

5. **BRADYCINETUS LILLJEBORGII**, G. O. Sars.

Hab. Norway, North Atlantic.

6. **PHILOMEDES INTERPUNCTA**, Baird, sp. (Plate XXVI. figs. 1–5.)

Cypridina interpuncta, ♂, Baird, 1850.
Philomedes longicornis, ♂, Lilljeborg, 1853; G. O. Sars, 1865; ? ♀, Norman, 1861.
Philomedes interpuncta, ♂, Brady, 1868.

Female. Carapace much more rounded and more tumid than that of the male, and rather smaller; seen from the side subelliptical, highest in the middle; superior and inferior margins both strongly convex; posterior extremity obliquely truncate, and bearing at the angles two distinct and sharp backwardly projecting convergent spines; height equal to two-thirds of the length. Seen from above regularly ovate, widest in the middle; width equal to about half the length; mucronate behind, obtusely acuminate in front. Superior antennæ short and stout; setæ short and subequal; natatory branch of the inferior antenna having its setæ exceedingly short, secondary branch indistinctly biarticulate, the first joint bearing three setæ (one of which is of moderate length and plumose) on its outer margin, second joint having one marginal and two very minute terminal setæ. Length $\frac{1}{15}$ inch.

Hab. Norway, west coasts of Scotland and Ireland, Shetland, Northumberland coast, Plymouth Sound, Channel Islands, Fosse de Cap Breton.

The only places where the female has been found are Cap Breton and Loch Long in Scotland, in the last of which localities both sexes were dredged in considerable numbers, at a depth of 4–10 fathoms, by my friend Mr. D. Robertson. The Scottish specimens are smaller than those from the Bay of Biscay, but in other respects present the same characters.

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* The term "oviferous foot" seems scarcely applicable to this limb, as it exists in the male in precisely the same degree of development as in the female.

The male of this species is already sufficiently well known; but the female has not heretofore been described, unless, indeed, the form figured by Mr. Norman in the 'Annals and Magazine of Natural History' for 1861 may be supposed to belong to that sex. Mr. Norman's description, however, so far as the structure of the antennæ is concerned, applies only to the male. Externally the male is easily distinguished by its more elongated and angular form, and by the want of spinous armature at the posterior extremity, the lower angle of which is produced into a blunt subangular prominence; the upper angle, however, occasionally bears a small tooth.

7. PHILOMEDES FOLINII, nov. sp. (Plate XXVII.)

Female. Carapace as seen from the side subrhomboidal; greatest height situated in the middle and equal to at least two-thirds of the length; anterior extremity very prominent in the middle, beak broad and blunt, notch wide and rather shallow; posterior produced at the ventral angle into a broad triangular projection; superior margin boldly and evenly arched, inferior also distinctly but somewhat less strongly convex. Seen from above the outline is subhexagonal, with nearly parallel sides, which converge suddenly and angularly towards the extremities; anterior extremity truncate, notched in the middle, posterior very broadly and bluntly mucronate; greatest width equal to rather more than half the length: the end view is irregularly heptagonal, the nearly parallel lateral margins ending above and below in prominent rounded angles, the two superior margins converging into an irregular arch, the basal margin nearly flat. The surface of the shell is irregularly undulated and closely set throughout with rounded or subangular sharply cut pittings of moderate size and depth, and is strengthened by several strongly projecting rounded ribs, which are disposed as follows: one commencing immediately below the antennal notch, in a conspicuous angular projection, is continued round the interior part of the shell and terminates in the posteal spine; a second (which is irregularly nodulated at the hinder extremity) rises in the posteal spine, runs upwards within the posterior margin, and then strikes somewhat obliquely across the valve, terminating in a long and sharp beak, which forms the anterior margin of the antennal notch: these two ridges are connected behind the notch by a short transverse prolongation, which gives off from near its middle a third long and rather flexuous rib running parallel with and midway between those already described, but losing itself before quite reaching the posterior margin; just within the antero-superior border a fourth but much more feebly developed rib runs backwards to the middle of the superior margin, where it joins an encircling dorsal ridge of about equal development. Length $\frac{1}{11}$ inch.

Male. The shell of the male (possibly a young specimen) is altogether smaller, but comparatively much more elongated, the height being equal to only half the length; the shell-structure is similar in character to that of the female, but very feebly developed. Length $\frac{1}{12}$ inch. The secondary branch of the lower antennæ in the female is composed of one small joint, from the expanded base of which arise four short setæ, from the apex one minute seta, and from the middle of the upper margin one of excessive length and plumose. The length of the secondary branch in the male is very great, equalling that of the primary branch.

Hab. Fosse de Cap Breton (Bay of Biscay), 70 fathoms.

8. Asterope elliptica, Fischer.

Hab. Mediterranean.

9. Asterope mariæ, Baird, sp.

Cypridina mariæ, Baird, 1850.
Cylindroleberis mariæ, Brady, 1868.

Hab. Shetland, West of Scotland, Penzance, Channel Islands, Bay of Biscay.

10. Asterope teres, Norman, sp.

Cypridina teres, Norman, 1861.
Cylindroleberis teres, Brady, 1868.

I am not disposed, without further proof, to indorse the opinion of G. O. Sars that this is the female of the foregoing species. It is indeed possible that such may be the case, and their occurrence in company (taken in the same gatherings) lends some probability to the supposition; but I have already described, in my "Monograph of the Recent British Ostracoda," a form differing in anatomical structure very remarkably from the male *A. mariæ*, and differing, too, just in those parts where sexual distinctions would be likely to show themselves. I have not materials at hand to reinvestigate this subject; but the examples from which my descriptions were taken certainly bore a closer resemblance to the male *A. mariæ* than does *A. teres*. If, then, *A. teres* be the true female of *mariæ*, we must also have another and very closely allied species confused with the former. Further examination is requisite before pronouncing decidedly in the matter.

11. Asterope abyssicola, G. O. Sars.

Hab. Norway.

12. Asterope norvegica, G. O. Sars.

Hab. Norway.

EXPLANATION OF THE PLATES.

Plate XXVI.

Philomedes interpuncta.

Fig. 1. Carapace of female, seen from left side. × 40.
2. Carapace of female, seen from above. × 40.
3. Superior antenna of female. × 84.
4. Inferior antenna of female: *a*, portion of basal joint; *b*, natatory branch; *c*, secondary branch. × 84.
5. Mandibular foot of female. × 84.

Bradycinetus brenda.

Fig. 6. Mandibular foot of male: *a*, mandibular process.

PLATE XXVII.

Philomedes folinii.

Fig. 1. Carapace of male, outline, seen from left side. × 20.
2. Carapace of female, seen from left side. × 40.
3. Carapace of female, seen from above. × 40.
4 Carapace of female, seen from front. × 40
5. Secondary branch of lower antenna of female. × 210.

4. Additional Notes on *Rhinoclemmys mexicana*.

By Dr. J. E. GRAY, F.R.S. &c.

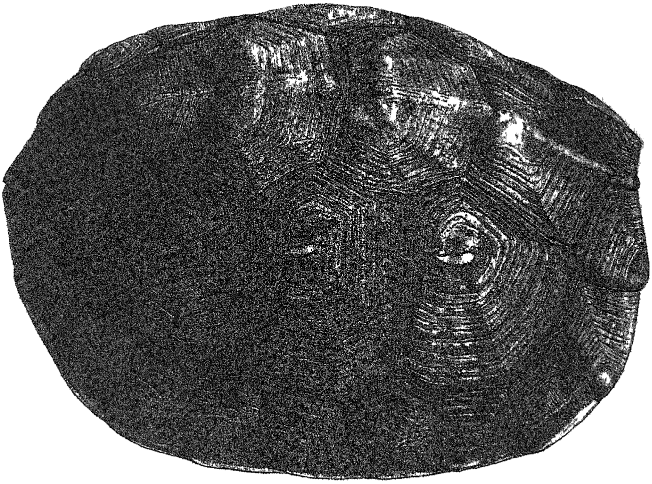
[Received April 3, 1871.]

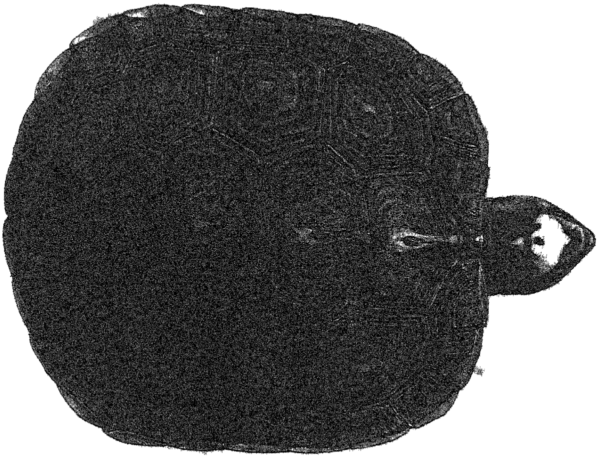
(Plate XXVIII.)

In the 'Proceedings' of this Society for 1870, p. 659, I described a species of *Rhinoclemmys*, under the name of *R. mexicana*, from a specimen which we had received from M. Sallé; and in the month of November for the same year I figured the head of the animal (P. Z. S. 1870, p. 723, fig. 4). The specimen I first described appeared to have the normal colouring of the genus; that is to say, the shell appeared to be of a nearly uniform dark colour above and below, with a pale margin forming a submarginal ring to the sternum. The specimen since I described it has been mounted and varnished; and it now appears to be more olive-colour, slightly variegated with darker streaks and imperfect irregular paler rings; and each of the dorsal shields is marked with a yellow spot, which I had not observed in any other species of this natural genus.

We have lately received from M. Boucard two other specimens of Emydes from Mexico with their heads; and, from the colouring of their heads, there can be no doubt (though the shells look very unlike the typical specimens of *Rhinoclemmys mexicana*) that they belong to the same species; and in both of them the yellow spot in the centre of the areola is distinctly marked, being linear in the adult and large and circular in the young. And the colouring of the young explains the slightly variegated appearance of the typical adult specimen first described.

The young specimen is olive-brown above, and pale yellow-brown, being darker in the central line of the sternum and over the sternal costal suture, below. The marginal shields are pale-spotted, and with a distinct pale semitransparent acute outer margin. The vertebral shields have two or three ovate concentric yellow rings, most distinct on the second and third, and an oblong central yellow spot, which is sometimes divided in half. The costal shields have two yellow subcircular rings, and a large yellow spot on the middle of the large areola. The head of this animal is coloured like that of





G H Ford

Mintern Bros imp

Rhinoclemmys mexicana

the adult animal originally described and figured. The hinder costal shield and the last vertebral one are small compared with the rest, and are about equal in size.

The other adult specimen has an entirely different external appearance from the typical specimen, so much so that one would hardly believe that it belonged to the genus *Rhinoclemmys*, which is usually so uniformly coloured and generally so smooth. It is of a pale brownish yellow above and below, being only rather darker on the sutures between the marginal and dorsal shields, between the sternal shields and the marginal shields. The dorsal and marginal shields are deeply concentrically grooved, and marked with elevated ridges radiating from the angles of the areola; the lower shields are similar, but not so uniformly grooved. When the dorsal shields are very closely examined they are found to be variegated with numerous dark-brown dots leaving indications of concentric rings; and these spots are more abundant in the areola, which is marked with a distinct yellow streak or oblong spot surrounded by a dark edge. The two hinder costals are small, regular in their shape, and partly overlap the small irregular last vertebral shield.

5. Additional Notes on the Genera *Eupleres* and *Galidia*, and Note on *Lemur ruber*. By Dr. J. E. Gray, F.R.S.

[Received April 3, 1871.]

The British Museum has recently received some additional specimens of Mammalia from Madagascar, collected by Mr. Crossley, who was sent out for the purpose by Mr. Ward of Halifax. Among the animals received is a skin, in a more perfect state, of *Eupleres goudoti*, and two skeletons of the same, which I hope to induce Mr. Flower or some other osteologist to describe in detail.

The skin shows that the acute nose of *Eupleres* has a distinct but narrow central groove, and that it must be referred to the family *Viverridæ*, and will form, in the first section of that family with hairy soles to the feet, a peculiar tribe called *Euplerina*, characterized by the form of the skull.

In the same collection are adults of *Galidia elegans* and *G. concolor*, which are easily distinguished by having a naked band extending on the sole of the hinder feet. The nose of this genus is rather produced beyond the teeth, and has a distinct groove beneath. The claws of *Galidia* and *Eupleres* are arched, compressed, and acute, and partly retractile, but are evidently always raised from the ground, so as to be kept in this acute state.

In the collection there was also a series of specimens of *Varecia rubra*, Gray, Cat. Monkeys & Lemurs British Museum, p. 71. All the specimens had the head, the tail, and the fore feet, and the underside of the body and four legs, intense uniform black, the back of the neck and a spot on the upperside at the base of the tail pure white; the fur of the other parts of the back and sides varied from dark red-brown to reddish white or even white; and the various intermediate shades, sometimes the pale reddish-white ones, were darker on the middle of the hinder part of the back.

In most of the specimens the outer sides of the arms and shoulders were the same colour as the back; but in the one that has the back nearly white the hairs of the shoulders and the outside of the fore and hind legs look white from their white tips, though they are deep black for two-thirds of their length; and in one specimen the outside of the arm and the shoulder are as black as the hand, and the whole of the fur of the body has a black base to the hairs. The whiskers and sides of the neck are the same colour as the back. One of the specimens, of a pale foxy colour, is undoubtedly a male; the red and white specimens are probably males, but the skins do not bear any mark of the sex.

April 18, 1871.

Dr. E. Hamilton, F.Z.S., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of March 1871.

The total number of registered additions to the Society's Menagerie during the month of March 1871 was 110, of which 6 were by birth, 52 by presentation, 45 by purchase, 2 by exchange, and 5 were animals received on deposit. The total number of departures during the same period by death and removals was 94, showing a net addition of 16 individuals to the collection during the month.

The most noticeable arrivals during the month were:—

1. A Squirrel from Acapulco, in Western Mexico, presented March 2 by Lieut. G. R. Bromley, R.N., which appears to agree best with *Sciurus castanonotus* of Baird, described in the 'Report on the Mammals collected by the Mexican Boundary Survey,' p. 35, and figured pl. 5.

2. A young male Cape Hunting Dog (*Lycaon pictus*) purchased March 15. This peculiar Carnivore has not been represented in the Society's collection for many years. The last individuals exhibited were those that died in 1855*.

3. Two male Amherst's Pheasants (*Thaumalea amherstiæ*), purchased March 18, out of a collection of Chinese Pheasants deposited in the Society's Gardens some time previously. These birds are believed to have been received from the same collectors as those employed by Mr. J. J. Stone—concerning which I have made remarks P. Z. S. 1869, p. 468, and 1870, p. 128. Further details on the habits of this bird and the mode of its capture at Ta-tsien-lou

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* See P. Z. S. 1860, p. 180.

are given in a very interesting letter from M. L. D. Carreau, Apostolic Missionary in Thibet, published in a recent number of the 'Bulletin' of the Société d'Acclimatation of Paris (ser. 2, vii. p. 582).

4. A Civet Cat (*Viverra*) from Quiah, north of the Cameroons river, purchased March 27, the determination of which has caused me some little difficulty. It is manifestly specifically different from the Civet Cat now in the Society's collection, which was presented in 1860 by Mr. Edmund Gabriel, H.B.M. Commissioner at Loanda, and was, I believe, obtained in the vicinity of that city. The only second species of African Civet Cat described is, as far as I know, *Viverra poortmanni*, Pucheran*, "*similis* V. civettæ, *sed major vittaque oculari nigra nasum non transeunte*." This does not agree at all well with our newly acquired animal, which is remarkable for its long rounded and Genet-like tail, and for the much greater distinctness of the bands on the body than in *V. civetta*. But the black ocular band *does not* cross the nose in the Angolan animal, whereas it does in the specimen lately received from Quiah. Under these circumstances I cannot at present undertake to decide which of them (if either) is referable to *Viverra poortmanni*, and must wait until their death affords me an opportunity of making an accurate examination of them.

The accompanying figure by Mr. Smit (Plate XXIX.) will serve to render this doubtful animal more easily recognizable.

Mr. H. E. Dresser, F.Z.S., exhibited a specimen of the Yellow-billed Cuckoo (*Coccyzus americanus*) which had been picked up dead in a wood near Aberystwith by Mr. C. J. Williams, and sent up to town for examination by Captain Coscus of Unys Hir House, Llandovey, in whose collection it had remained. This made the fifth occurrence of this Cuckoo in Great Britain on record, four having been recorded by Yarrell.

The specimen above referred to showed no signs of having been in captivity, and was apparently a young bird.

Sir Victor Brooke, Bart., F.Z.S., exhibited and made remarks on a mounted specimen of an Esquimaux Curlew (*Numenius borealis*) which had been recently obtained near Sligo, in Ireland, and belonged to his own collection.

Prof. Owen, F.R.S., F.Z.S., read the second part of his memoir on the Dodo (*Didus ineptus*). This communication contained notes based on an articulated specimen of the skeleton of this extinct bird which had been recently prepared for the collection of the British Museum from bones transmitted from the Mauritius by Mr. G. Clark, C.M.Z.S.

This paper will be published in the Society's Transactions.

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* Rev. Zool. 1855, p. 304, et Arch. d. Mus. x. p. 109, pl. ix.

The following papers were read:—

1. On Japanese recent Brachiopoda. By Thomas Davidson, Esq., F.R.S., F.G.S., &c. (Communicated by J. Gwyn Jeffreys, Esq., F.Z.S.)

[Received April 18, 1871.]

(Plates XXX. & XXXI.)

It is to Mr. Arthur Adams that we are indebted for the discovery of by far the largest number of species of Brachiopoda hitherto procured from the Japanese waters. These species were dredged by him during the period extending from 1859 to 1861, and he gave a very brief account of them, without illustrations (if we except a single figure of *T. davidsoni*), in the 'Annals & Magazine of Natural History' for 1860 and 1863, as well as in the 'Proceedings of the Zoological Society' for 1867.

Mr. Adams enumerates the following species:—

1. *Terebratulina japonica*, Sow.
2. —— *caput-serpentis*, Linné.
3. —— *cumingii*, Dav.
4. *Terebratula davidsoni*, Adams.
5. *Waldheimia cranium*, Gmel.
6. —— *septigera*, Lovén.
7. —— *picta*, Chemn.
8. —— *grayii*, Dav.
9. *Terebratella coreanica*, Adams and Reeve.
10. *Terebratella mariæ*, Adams.
11. *Ismenia sanguinea*, Chemn.
12. —— *reevei*, Adams.
13. *Rhynchonella lucida*, Gould.
14. —— *woodwardii*, Adams.
15. *Crania japonica*, Adams.
16. *Discina stella*, Gould.
17. *Lingula tumidula*, Reeve.
18. —— *smaragdina*, Adams.
19. —— *jaspidea*, Adams.
20. —— *lepidula*, Adams.

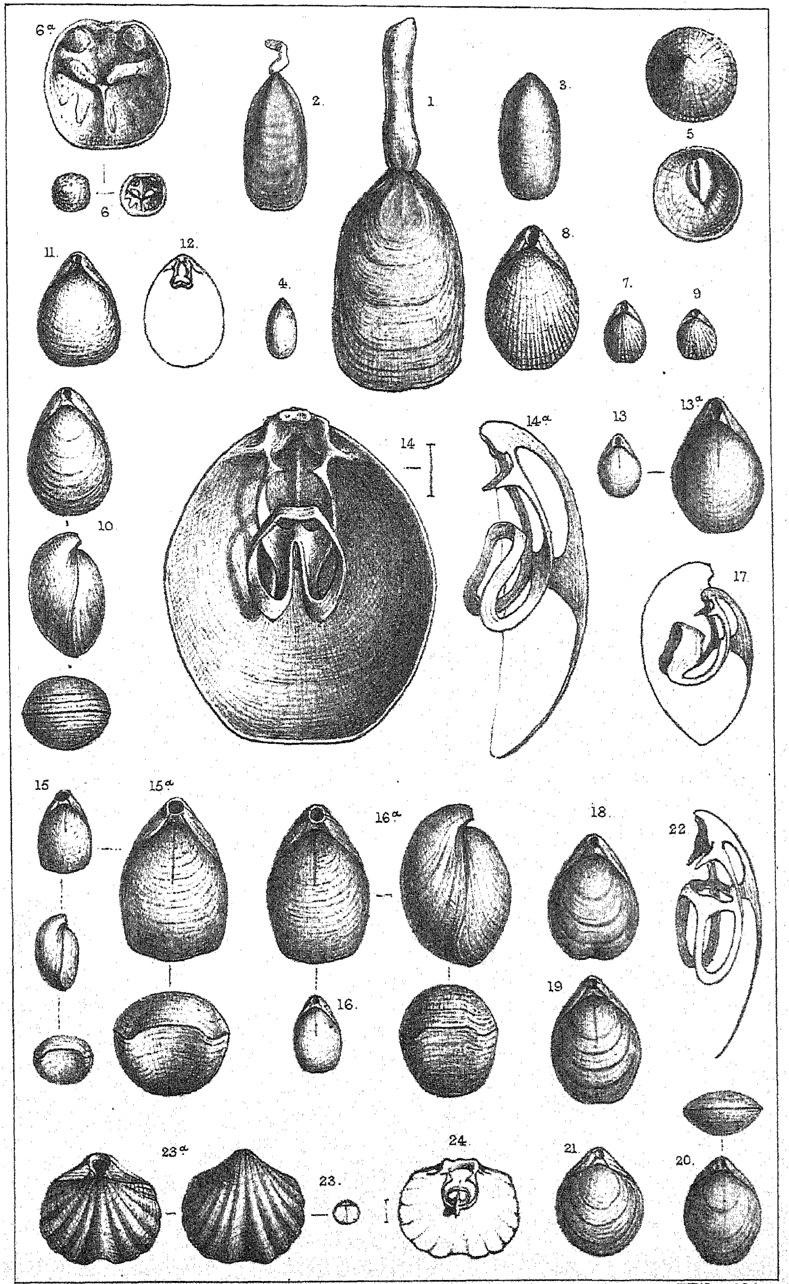
At the suggestion of Mr. A. Adams as well as Mr. Jeffreys, I have examined the original specimens of the shells above named; and I now beg to submit to the Zoological Society a revised list accompanied by illustrations of all the species.

It would result from my examination that the shells attributed to *Waldheimia cranium* and to *W. septigera* in Mr. Adam's paper will have to be referred to other species, as no authenticated example of those forms have, to my knowledge, been hitherto obtained from the waters of Japan. Some other modifications to the list will also be required, to which we will refer in the sequel. I will likewise add descriptions and figures of three or four more species that are either new or had been found in those waters by other naturalists.

No sea of a similar extent to that of Japan has furnished us with so large a series of species of Brachiopoda; and as their habitat as well as the depth at which they occur has been accurately determined by Mr. A. Adams, it is important that the identification of the species should be carefully determined and discussed.

The study of the recent Brachiopoda has been much increased and advanced during the last few years, thanks to the numerous dredging-

P.Z.S.1871.Pl.XXX.



Thos. Davidson del. et lith.
W. West & Cº imp.

Japanese recent Brachiopoda.

expeditions conducted by experienced naturalists, and extended to various latitudes; but there remains still much to be done before the true specific claims of all the described species will have been determined; even now Mr. W. H. Dall, of the Smithsonian Institution of Washington, has attempted a revision of the *Terebratulidæ*, in an able and lengthened communication which will be found published in the sixth volume of the 'American Journal of Conchology' (1870), to which I shall have to refer in the sequel.

Fam. TEREBRATULIDÆ, Cuvier.

In his recent publications Mr. Dall has proposed to subdivide the family into the genera *Terebratula, Terebratulina, Megerlia, Magas, Kraussina, Bouchardia, Platidia* (=*Morrisia*), *Megathyris* (=*Argiope*), ? *Thecidium*, to which he adds as subgenera *Laqueus, Ismenia, Magasella*, and *Cistella*. Dr. Leopold v. Schrenk would also consider *Rhynchonella* to be a subgenus of *Terebratula*; but in this view he will find but few supporters; and I regret likewise that Prof. Quenstedt should not have seen the propriety of frankly adopting Fischer de Waldheim's excellent genus *Rhynchonella*, one so clearly separated from *Terebratula* by the characters of its animal as well as by the structure of its shell. *Ismenia* Mr. Dall now relinquishes, having discovered that it is synonymous with *Megerlia*. Much difference of opinion has also been expressed as to the absolute necessity of substituting the term *Megathyris* for that of *Argiope*, a name previously made use of by Savigny for a genus of Egyptian Spiders. Mr. Jeffreys maintains that such a double application of the name in two different departments of zoology is not a reason for repudiating the second application of the same name, although such a practice ought to be avoided. The name *Argiope* has been in such general use for the shells to which it is referred, that I should regret to feel obliged to substitute that of *Megathyris*.

If we examine the various species of which the genus *Terebratella* is composed, we shall perceive a certain amount of modification not only in the length and elevation of the median septum, but likewise of the point at which the lateral branches of the loop become attached to the septum, this connexion being much closer to the beak or to the front in some species than in others, the loop itself, as may be seen by comparing such species as *T. dorsata* or *T. frontalis* with *T. spitzbergensis*, being likewise much more developed in some forms than in others; so that it becomes necessary to concede a certain variation in the internal details of the species of the same genus, and not to look upon each small deviation from the selected type as offering valid grounds for the creation of a separate subgenus. Mr. Dall proposes the adoption of a subgenus *Magasella*, of which my *Terebratella evansi* would serve as a type; but I feel more inclined to consider it a modification or subgenus of *Terebratella* than of *Magas*, from having noticed that in some species, such as *M. flexuosa*, the loop agrees exactly with that of *Terebratella*, while the septum is elevated as in *Magasella*. Indeed I am not quite satisfied as to the genus *Magas* having been represented in the recent state, although *T. patagonica* of Gould has been doubtfully referred to it.

Mr. Dall seems also inclined to separate *Thecidium* from the *Terebratulidæ*; but I do not feel convinced that he has clearly shown that Professors Suess, Deslongchamps, King, myself, and others have so much erred in considering the excavated lobes or crescents in the dorsal valve to be homologues of the loop. But that question may require further examination; and as no specimen of the genus has been hitherto obtained from the Japanese waters, I will defer the discussion to another occasion.

Genus TEREBRATULA, Llhwyd.

But very few recent species have been discovered. *Terebratula vitrea*, Born, *T. minor*, Philippi & Suess, *T. sphæroidea*, Phil., *T. uva*, Brod., and *T. cubensis*, Pourtales, have been referred to it; but it is still a question whether *T. cubensis* and *T. minor* are more than varieties of *T. vitrea*. A shell bearing great resemblance to the fossil *T. sphæroidea* of Philippi was also dredged by Messrs. Jeffreys and Kent near the coast of Portugal. Mr. Dall adds *T. unguiculus* (Cooper) to the recent species of the genus *Terebratula*; but I feel satisfied that Cooper's species will be more correctly placed in the genus or subgenus *Terebratulina*. From the Japanese waters we are acquainted with but a single species.

TEREBRATULA MINOR, Philippi & Suess. (Plate XXX. figs. 10, 11, 12.)

Terebratula vitrea, var. *minor*, Philippi, 1836.

Terebratula affinis, Calcara, 1845.

Terebratula davidsoni, A. Adams, Proc. Zool. Soc. p. 314, pl. 19. fig. 30, 1867.

This shell has been well described by Mr. Adams in the 'Proceedings of the Zoological Society.' Mr. Jeffreys, however, is of opinion that the Japanese specimens cannot be distinguished from the pliocene and recent specimens known under the designation of *T. minor* or *affinis*; and I must admit that Mr. Adams's two examples bear a good deal of resemblance to the European shell.

Hab. Dredged by Mr. A. Adams at Satanomosaki in 55 fathoms.

Subgenus TEREBRATULINA, D'Orb.

I am inclined to consider this to be a subgenus of *Terebratula*, as the characters of its loop so nearly approach to those of the last-named genus. The number of recent species attributable to this subgenus has been considerably exaggerated, and several of them are no more than local variations or synonyms of the well-known and far spread *T. caput-serpentis*; *T. japonica*, *T. septentrionalis*, *T. angusta*, *T. abyssicola*, *T. cancellata*, *T. cumingii*, and one or two more seem referable to the Linnean species. Mr. Dall believes *T.*

cailletti, Crosse, to be a good species; and perhaps so likewise is *T. unguiculus* of Cooper. *T. radiata*, Reeve, is certainly so.

From the Japanese waters Mr. Adams enumerates three or four species which appear to be all varieties or different states of growth of

TEREBRATULA CAPUT-SERPENTIS, Linn. sp. (Plate XXX. figs. 7, 8, 9.)

Terebratula caput-serpentis, T. japonica, T. cumingii?, A. Adams, Annals & Mag. of Nat. Hist. 3rd ser. vol. xi. p. 98, 1863.

Mr. L. Reeve observes, in his 'Monograph of recent Brachiopoda,' that "*T. japonica* is closely allied to *T. caput-serpentis*, and is without doubt its representative in the Corean and Japanese waters;" and in this view Mr. Jeffreys fully concurs.

Hab. Mr. A. Adams got:—*T. caput-serpentis* living at Tsu-Sima from 26 fathoms (sand and shell bottom), at Tsusaki 55 fathoms, Mino-Sima 63 fathoms; the variety *japonica* living at Tsusaki 55 fathoms, and Gotto, 48 fathoms, and in the Straits of Korea from 63 fathoms, and sixteen miles from Mino-Sima, the bottom being coarse black sand and broken shells; the variety *angusta* living from 54 fathoms off the island of Guelpart, seven miles from the shore, the bottom being black sandy mud. *T. caput-serpentis* was also dredged by Mr. Adams along with *T. coreanica* and *W. picta* off the Straits of Korea in 46 fathoms, four miles from Tsussima (at Tsu-Sima), from a bottom of sand and broken shells. Mr. Adams's specimens of *T. cumingii* (?) are evidently young examples of *T. caput-serpentis*, and were dredged alive at Tsu-Sima, 26 fathoms, and at Mino-Sima in 63 fathoms.

Genus WALDHEIMIA, King.

A number of recent species have been proposed, described, and illustrated; but I think they may be reduced to the following nine, viz.:—*W. flavescens*, Val. apud Lamk.; *W. venosa*, Sol.; *W. cranium*, Müll.; *W. grayi*, Dav.; *W. picta*, Chemn.; *W. lenticularis*, Desh.; *W. septigera*, Lovén; *W. floridana*, Pourtales; and *W. raphaelis*, Dall.,—these three last presenting a good deal of general external resemblance, although said to be specifically distinguishable.

WALDHEIMIA RAPHAELIS, Dall. (Plate XXXI. fig. 9.)

Waldheimia raphaelis, Dall, American Journal of Conchology, vol. vi. p. 111, pl. vii. figs. *a–d*, 1870.

This species has been described by Mr. Dall, who informs me that he has compared it carefully with authentic examples of *W. septigera*, Lovén, and finds it quite distinct—that it is more than twice as large as the largest *W. septigera* and of a different colour, the Japanese shell being deep brown, with a slight rufous tinge, while the hinge-plate, septum, ovaria, and muscular impressions present notable differences in their details. Mr. A. Adams does not appear to have found Mr. Dall's shell or Lovén's *W. septigera* during his Japanese dredgings, and mistook for this last a specimen of *Terebratella spitzbergensis*.

Hab. Japanese coast near Yeddo, dredged there by Prof. R. Plumpelly. The original specimen forms part of the Smithsonian cabinet.

WALDHEIMIA PICTA, Chemnitz, sp. (Plate XXXI. fig. 10.)

Waldheimia picta, Adams, Annals & Mag. of Nat. Hist. vol. xi. 3rd ser. p. 99, 1863.

Hab. This well-known and beautiful species was obtained by Mr. A. Adams in 55 fathoms off Stormy Cape, Tschitikoff, or Satanomosaki. Along with it was found *T. minor* or *davidsoni* of Adams.

WALDHEIMIA GRAYI, Dav. (Plate XXXI. figs. 7, 8.)

Waldheimia grayi, Adams, Annals & Mag. Nat. Hist. 3rd ser. vol. xi. p. 99, 1863.

Terebratula grayi, Davids. P. Z. S. 1852, p. 76.

This fine species was fully described and illustrated by myself in the 'Proceedings' of this Society, and again by Mr. L. Reeve in his monograph of the genus *Terebratula.* It is a very variable shell; and Mr. Adams believes that it was to a very transverse variation in shape of this species (fig. 8) that Mr. Gould had applied the designation of *T. transversa*; but some uncertainty would appear to prevail in this matter, as Gould's original specimen is no longer to be found. Most of his types belong to the Smithsonian collection.

Hab. It occurs abundantly with *T. coreanica* in the Bay of Hakodadi and Mososeki, where it was dredged up by Mr. A. Adams in 7 fathoms, some large stones having eight or ten examples adhering to it. Admiral Sir E. Belcher dredged it also in the Strait of Korea, and it could be seen washed up on a beach by thousands.

Genus TEREBRATELLA, D'Orb.

This genus is largely represented in the recent state; but some further study of the named, described, and illustrated so-termed species will still be required before the exact number of true species can have been correctly determined. *T. dorsata,* Lam. (=*magellanica,* Chem.); *T. cruenta,* Dilwyn (=*T. zelandica,* Desh.); *T. rubicunda,* Sol., Mus. Banks; *T. caurina,* Gould; *T. coreanica,* Adams and Reeves (=*miniata,* Gould); *T. mariæ,* A. Adams; *T. pulvinata,* Gould; *T. frontalis,* Mid.; *T. bouchardii,* Dav.; and *T. labradorensis,* Sow., have been generally adopted; but the last four will demand further examination before their specific claims can be fully ascertained and confirmed,

TEREBRATELLA COREANICA, Adams & Reeve. (Plate XXXI. figs. 4, 5.)

Terebratella coreanica, Adams & Reeve, Voyage of the Samarang, p. 71, pl. xxi. fig. 3 (1850), and Adams. Annals and Mag. of Nat. Hist. 3rd ser. vol. xi. p. 99, 1863.

T. coreanica, Dr. Leopold v. Schrenck, Mollusken des Amur-Landes &c. p. 468, tab. xviii. figs. 1–7 (1867).

This beautiful species has been well described by Adams and Schrenck. It varies considerably in shape and colour, so much so, indeed, that Dr. Schrenck has proposed to distinguish some of its shapes by the designations of Forma normalis, Forma longior, and Forma latior; but all these variations merge one into the other when we examine a large series of specimens. Some young and middle-aged examples are of a light yellow colour radiated with red. Other specimens present a uniform red colour, especially deepened in tint near to, and at, the concentric lines of growth. Some examples have also attained to 2 inches in length, with a slightly greater breadth.

Hab. Dr. Schrenck states this shell to be the most common of all the Brachiopoda in the sea of North Japan. Mr. A. Adams obtained it abundantly in 7 fathoms, along with *W. grayi*, at Hakodadi, also off Okerisi Island in 25 to 35 fathoms, six miles distant from the shore, and from a bottom of coral and rock. It occurs also at a depth of 48 fathoms in the Straits of Korea and in several other parts of the Korean archipelago.

A yellow *Terebratula* (Plate XXXI. fig. 6) was sent to me by Mr. A. Adams as a yellow variety of *T. coreanica*, and as having been dredged at Hakodadi; but I feel considerable uncertainty as to its being thus correctly identified. The loop was unfortunately entirely broken, so that I could not ascertain its internal characters. In external shape it much resembles some young examples of *Waldheimia venosa* or of *Terebratella pulvinata*. I will not, therefore, venture upon a specific identification, but have given a figure of the shell in the hope that it may be hereafter properly identified.

TEREBRATELLA MARIÆ, A. Adams. (Plate XXX. figs. 15, 16, 17.)

Terebratella mariæ, Adams, Annals & Mag. of Nat. Hist. 3rd ser. vol. v. p. 412, May 1860; and Annals, 3rd ser. vol. xi. Feb. 1863.

This pretty and very interesting little species was correctly described by Mr. A. Adams. It is a very important shell, as it nearly approaches in shape and character to the Pliocene species from Sicily, described by Seguenza as the *Terebratella septata* of Philippi. It is of a pure white colour, with numerous delicate concentric lines of growth. None of the specimens found by Mr. Adams seems to have exceeded some 6 lines in length by 4 in breadth. It is considered by Mr. Jeffreys the living representative of the Sicilian fossil species; but this last attained much larger proportions, and would appear to be more finely punctuated than is the Japanese shell, so that I should not like to affirm the positive identity of the two shells, although Mr. Jeffreys may be correct in his conclusions.

Hab. Uraga, 21 fathoms; Gotto, 48 fathoms; Satanomosaki, 55 fathoms.

TEREBRATELLA SPITZBERGENSIS, Dav. (Plate XXX. figs. 13, 14.)

This well-known species, according to Torell, seems to have been first noticed by Sir C. Lyell in his paper on the rising of Sweden (Phil. Trans. p. 36, tab. 2. figs. 32, 33, 1835), but that eminent geologist did not apply to it any specific denomination. In 1837 Hisinger confounded it with *T. caput-serpentis*; and in his memoir, 'Bidrag till Spitzbergens Molluskfauna,' p. 121, tab. i. fig. 1, 1859, Prof. O. Torell gave an incomplete illustration of its loop. I have therefore availed myself of the present opportunity to add a complete figure of the interior of the dorsal valve from a Japanese specimen of the species.

Hab. This shell was detected by myself among some specimens dredged by Mr. A. Adams at Satanomosaki in 55 fathoms. Mr. Jeffreys has also furnished me with the following list of localities where the species has been found:—Hornsund and Bellsund, Spitzbergen, 40–80 fathoms (*Torell*); Wellington Channel (*Belcher*); Shetland, 35 miles N.N.W. of Unst, 90–100 fathoms; Channel slope, about 185 miles from Cape Clear and Ushant, and 165 miles from the Scilly isles, 358 fathoms, living attached to a piece of coral, *Lophohelia perforata*; Channel slope, not far from last locality, in 539 fathoms; off Cape St. Vincent, on the coast of Spain, 292 fathoms (*Jeffreys*). It has also been recorded from Spitzbergen by Goodsir, and by P. P. Carpenter from Murray Bay, Gulf of St. Lawrence. Mr. Jeffreys mentions it likewise in his paper entitled "Report on Uddevalla Fossils," published in the proceedings of the British Association. Mr. Dall had inadvertently referred this species to his subgenus *Magasella*, but is now of opinion that it should be left where I had originally placed it in 1845.

Subgenus LAQUEUS, Dall.

This is a subgenus recently proposed by Mr. Dall for the reception of shells which, like *T. californica*, Koch, and *T. rubella*, Sow., have the reflected part of the loop attached by two lateral processes, not to the septum nor to the septal processes, but to the hæmal portions of the loop (Plate XXX. fig. 22).

LAQUEUS RUBELLA, Sow., sp. (Plate XXX. figs. 18–22.)

Terebratula rubella, Sow. Thesaurus Conchyliorum, vol. i. p. 350, pl. 69. figs. 40, 41, 42, 1846.

Waldheimia cranium, A. Adams (but not of Müller), Annals and Mag. of Nat. Hist. vol. xi. 3rd ser., Feb. 1863.

Laqueus suffusa, Dall, n. sp.?, American Journal of Conch. vol. i. part 2, p. 125, pl. 7. figs. *g*, *h*, *s*, 1870.

This is an important Japanese species; it varies much in shape and coloration, and especially so with age. Having had an opportunity of examining a rather large series of specimens, I believe myself justified in stating that the *L. suffusa* of Dall is a half-grown example of Sowerby's species. Mr. Jeffreys and myself have also ascertained that the shell referred by Mr. A. Adams to *W. cranium*, from Japan, belongs likewise to the species under description.

When young, *L. rubella* has an oblong-ovate shape, tapering and rounded at the front, but when full-grown is nearly straight, or even sometimes slightly sinuated at the frontal margin. The different variations I have observed in this shell are figured in Plate XXX. The foramen is small, and with age becomes gradually more distant from the hinge-line by the development of the deltidium plates. The surface is smooth. In colour it varies considerably: some specimens are ashy white; others have a general salmon-colour, which deepens into orange-red near the lines of growth or margins of the shell. In some examples, besides a general reddish tint, a few ruddy rays mark the lateral portions of the shell, but rarely so strongly defined as in Sowerby's figure, in which the coloration is exaggerated.

Hab. Sowerby states that his specimen of *T. rubella* was obtained from Japan. Mr. A. Adams dredged it from a clear stony bottom off the pretty little island of Kuro-Sima, at a depth of 35 fathoms. Prof. R. Plumpelly gives as its habitat the wharf at Yokohama, Japan (*Dall*).

Subgenus MAGASELLA, Dall.

This subgenus would comprise the following recent species:—*M. evansi*, Dav.; *M. crenulata*, Sow.; *M. inconspicua*, Sow. (according to Dall); *M. flexuosa*, King; *M.* (*Ter.*) *suffusa*, Reeve (of this species I possess the original specimen, and can assert that it possesses the elevated septum and loop of *Magasella*); *M. lævis*, Dall; *M.* (*T.*) *Cumingii*, Dav.?; and the following two new Japanese species:—

MAGASELLA ADAMSI, Dav. (Plate XXX. figs. 23, 24.)

Shell small, nearly circular, as broad as long; dorsal valve slightly convex, and marked with about eleven more or less prominent ribs, of which the central one, in the dorsal valve, is both the largest and most elevated. Ventral valve deeper than the opposite one, with about twelve ribs, of which the two central ones are both the largest and most prominent, leaving a deepish median sulcus between them; beak truncated by a rather large incomplete foramen; deltidium-plates small; shell-punctures large and prominent; colour white. In the interior of the dorsal valve there exists a *Magasella*-shaped prominent septum, extending from under the umbonal beak to about half the length of the valve, and to the lateral sides of it are attached the principal pair of lamellæ prior to becoming reflected. Length 2, width 2, depth 1 line.

Hab. Two examples of this small species were dredged by Mr. A. Adams in 26 fathoms water in the sea of Japan, off the island of Kuro-puna. In some specimens the ribs are almost obsolete.

MAGASELLA GOULDI, Dall, MS. (Plate XXXI. fig. 11, *a*, *b*, *c*.)

Shell small, transversely oval, wider than long; hinge-line nearly as long as the breadth of the shell; beak somewhat produced and slightly incurved, with a large incomplete horseshoe-shaped foramen; deltidium-plates very small and widely separated; false area flattened. Ventral valve deep; dorsal valve slightly convex. Surface of each valve marked with about eighteen ribs; of these, two fine median ones lie in a kind of sulcus in each valve and extend from the umbo to the front, while the others are both irregular in width, stouter, and do not extend to more than half of the length of the valve from the margin. The lines of growth are well marked. The shell is of a yellowish colour, with strong rose-colour on the ribs and towards the edges. In the interior of the dorsal valve there is no hinge-plate or distinct cardinal process; the muscular scars are thick and excavated above; the septum and loop is similar to that described in the preceding species. Length 2, width nearly 3 lines.

Mr. Dall has kindly allowed me to add this description to my notes on Japanese species. A single example was found by him attached to a specimen of *T. coreanica* or *miniata*, Gould, that had been dredged at Hakodadi in 60 fathoms of water.

It evidently much approaches in character to my *M. adamsi*; but there are differences between the two that cannot be cleared away by the inspection of a single specimen. It must therefore be left for future observers to determine whether the two may not constitute variations in form of a single species.

Genus MEGERLIA, King.

M. truncata, Linné, *M. monstruosa*, Scacchi (if not a variety of the first-named species), *M. sanguinea*, Chem., and its var. *reevei*, Adams, are the only recent species attributable to this genus. Mr. Dall is of opinion that there is no difference in the interior of *M. sanguinea* and *M. truncata*, except that the lateral lobes are open instead of closed in *M. truncata*, and that this and the external shape of the shell may perhaps serve as characters for the creation of a subsection. I do not myself, however, see the necessity of coining for it another subgeneric designation.

MEGERLIA SANGUINEA, Chemnitz. (Plate XXXI. figs. 1, 2.)

Anomia sanguinea, Chemnitz, 1785,=*Terebratula erythroleuca*, Quoy,=*T. sanguinea* and *pulchella*, Sow.,=*Megerlia sanguinea*, Dav.,=*Ismenia sanguinea*, Adams and Dall.

All the specimens I have seen of this beautiful little shell were of a whitish or rather yellowish colour freckled with bright crimson.

Hab. *M. sanguinea* has been found in several localities. Mr. A. Adams dredged it alive at Mino-Sima in 63 fathoms. It is common near the Philippine and Sandwich islands, and was dredged plentifully in 1859 at Tahiti by Mr. Deplanche.

Var. REEVEI (Plate XXXI. fig. 3)=*Ismenia reevei*, A. Adams, Ann. & Mag. Nat. Hist. vol. xi. 3rd. ser. p. 99, 1863.

Only one example of this shell appears to have been found by Mr. A. Adams. Its colour is pure white, and it closely resembles the type of *M. sanguinea* in all other respects, except perhaps in size, the specimen of *M. reevei* dredged by Mr. Adams exceeding somewhat in proportions any of the examples of *M. sanguinea* that have come under my notice. It measured 8 lines in length by 7 in width and 4 in depth.

Hab. Gotto, 48 fathoms.

Family RHYNCHONELLIDÆ, J. E. Gray.

Genus RHYNCHONELLA, Fischer de Waldheim.

The recent forms are few in number. *Rh. psittacea*, Gmelin, = var. *woodwardi*, Adams (?). *Rh. nigricans*, Sow., *Rh. grayi*, Woodward, *Rh. lucida*, Gould, and *Rh. sicula*, Sequenza, MS., are all the species with which we are at present acquainted.

RHYNCHONELLA PSITTACEA, Gmelin, var. WOODWARDI, A. Adams. (Plate XXXI. fig. 12.)

Rh. woodwardi, A. Adams, Annals & Mag. of Nat. Hist. 3rd ser. vol. xi. p. 100, 1863.

M. Adams states in his paper that "this species differs from *Rh. psittacea* in being concentrically striolate instead of radiately grooved; the beak, moreover, is smaller and less curved; the form is more broadly triangular, and the ventral margin rounded and produced in the middle. The young possess the same characters seen in the adult. *Hab.* Gotto, 48 fathoms; also off Rifunsiri Island, 4 miles from the shore, in 35 fathoms, from a bottom of coral, broken shells, and stones."

I have been able to examine two examples of this shell, and could distinctly perceive faintly marked radiating striæ, similar to those that cover the surface of *R. psittacea*. I cannot help thinking, and I am confirmed in this opinion by Mr. Jeffreys, that the *R. woodwardi* of Adams is no more than a local variety of *R. psittacea*. The colour of the two specimens obtained by Mr. Adams are of a less bluish tint than we find usually in the shell last named; but some examples of *R. psittacea* from the northern European seas have also assumed that colour.

RHYNCHONELLA LUCIDA, Gould. (Plate XXXI. figs. 13, 14.)

Rh. lucida, Gould, Proc. Bost. Soc. Nat. Hist. p. 323, 1860, and Otia Conch. p. 121; Adams, Annals and Mag. of Nat. Hist. 3rd ser. vol. xi. p. 100, 1863.

Shell small, obtusely subrhomboidal or ovate, rather longer than wide; dorsal valve convex, almost gibbous; mesial fold wide, commencing to rise at about half the length of the valve. Ventral valve rather less convex or deep than the opposite one, and scooped out near the front in the form of a deepish sinus; beak acute, sharply incurved; foramen beneath the extremity of the beak, completed by a deltidium. Surface smooth, of a light whitish glassy grey; shell-structure fibrous. Length 6, width 5, depth 3 lines.

This very interesting species had never been completely described or illustrated. It was briefly noticed by Gould in 1860; but his observation that it might be taken for a small *T. vitrea* is quite incorrect; for it bears no resemblance to that species, and is a true *Rhynchonella*, and approaches most in shape and surface to some small examples of the Tertiary *Rhynchonella bipartita* of Brocchi, and almost represents that species in the living state. In this last remark Mr. Jeffreys concurs with me.

Hab. Dr. Gould's specimens were dredged off the Japan coast, 30° 35′ N., 130° 40′ E., in 110 fathoms, sand, by Captain Stevens of the 'Hancock.' Mr. A. Adams obtained it at Satanomosaki, 55 fathoms, and at Gotto in 48 fathoms.

Family LINGULIDÆ, Cuvier.

Genus LINGULA, Brug.

Mr. Dall has proposed a genus *Glottidia*, in which he has placed some of the species formerly classed with *Lingula*; but even now the number of recent so-termed species referred to the last-named genus are too numerous, and will require to be carefully studied and monographed.

The genus *Lingula* made its first appearance in the Lower Silurian rocks; and some of its fossil forms bear much general resemblance to one or two of the species now found alive, but are of course specifically distinct. Mr. A. Adams has dredged in the waters of Japan four species, which appear to be tolerably distinct.

LINGULA TUMIDULA, Reeve. (Plate XXX. fig. 1.)

Lingula tumidula, Reeve, Conch. Icon. sp. 2; A. Adams, Annals and Mag. of Nat. Hist. 3rd ser. vol. xi. p. 100, 1863.

I have seen but one Japanese specimen, attributed by Mr. Adams to Mr. Reeve's species. It is, however, a smaller shell, of a light yellow colour, with a reddish-brown spot near the beak. Exteriorly the shell is marked with a considerable number of close, almost equidistant, minute concentric projecting lines of growth, somewhat similar to those we see in *Lingula scotica* from the Carboniferous period.

Hab. From the mud of Tsaulian harbour, in the Korean archipelago, 7 fathoms.

LINGULA SMARAGDINA, A. Adams. (Plate XXX. fig. 2.)

Lingula smaragdina, A. Adams, Annals & Mag. of Nat. Hist. 3rd ser. vol. xi. p. 101, 1863.

It is of a bright green colour, whitish in the middle and near the beaks. Length 10, width 4 lines. It most resembles *L. hirundo*, Reeve.

Hab. Was found by Mr. A. Adams at Yobuko, 10 fathoms, mud, and also in the China sea.

LINGULA DUMORTIERI, Nyst. (Plate XXX. fig. 3.)

Lingula dumortieri, Nyst, Coq. et Polyp. Foss. de la Belgique, p. 337, pl. xxxiv. fig. 4, 1843.

Lingula jaspidea, A. Adams, Annals and Mag. of Nat. Hist. 3rd ser. vol. xi. p. 101, 1863.

Of the recent shell I have seen only one example, which had been dredged by Mr. A. Adams at Mososeki, in 7 fathoms, mud bottom. It is of an elongated oval shape, about 9 lines in length by 5 in breadth, tapering towards the front, and is of a warm yellow-brown colour.

Mr. Jeffreys is of opinion that this *Lingula* cannot be specifically distinguished from *Lingula dumortieri* from the Coralline Crag of Suffolk and of Belgium by any one character. He has compared it with three specimens of the latter, but in every one, where the outline and beak was complete, these exactly agreed with the Japanese recent species. All (both fossil and recent) have peculiar though slight and almost microscopic and close-set longitudinal lines, which, of course, are more distinct in the fossil than in the recent shell.

LINGULA LEPIDULA, A. Adams. (Plate XXX. fig. 4.)

Lingula lepidula, Adams, Annals & Mag. of Nat. Hist. 3rd ser. vol. xi. p. 101, 1863.

This is a small oval-shaped species, tapering a good deal at the beaks, about 4 lines in length by 2 in breadth. In colour it is yellowish, slightly tinted with green. Mr. Adams observes that it is as small as *L. semen*, and shaped like *L. ovalis*.

Hab. Mr. A. Adams dredged several examples in the inland sea, or, as the Japanese call, it Seto-Uchi (Akasi) in ten fathoms, mud.

Family CRANIIDÆ, Dav.

Genus CRANIA, Retz, 1781.

Mr. Jeffreys informs me that it was Philipsson, and not Retz or Retzius, who first proposed the generic name of *Crania* ('Dissertatio historico-naturalis, sistens nova Testaceorum genera:' Lundæ, 1788). But Mr. Dall assures me that Retz had done so some years before Philipsson.

CRANIA JAPONICA, A. Adams. (Plate XXX. figs. 6, 6*a*.)

Crania japonica, Adams, Annals & Mag. of Nat. Hist. vol. xi. p. 100, 1863.

This is a small species, in which the central pair of muscular prominences are very much developed. All the valves found by Mr. Adams are a little worn.

Hab. From deep water, 71 fathoms, among the Gotto group of islands.

Family DISCINIDÆ, J. E. Gray.

Genus DISCINA, Lamarck.

DISCINA STELLA, Gould. (Plate XXX. fig. 5.)

Discina stella, Adams, Annals & Mag. of Nat. Hist. 3rd ser. vol. xi. p. 100, 1863.

Hab. Seto-Uchi (Akasi), 17 fathoms; Tsu-Sima, 17 fathoms; Tabu-Sima, 26 fathoms, on coral bottom; Tou-Sima, in 25 fathoms.

EXPLANATION OF THE PLATES.

Plate XXX.

Fig. 1. *Lingula tumidula*, Reeve.
2. —— *smaragdina*, A. Adams.
3. —— *dumortieri*, Nyst, = *L. jaspidea*, A. Adams.
4. —— *lepidula*, A. Adams.
5. *Discina stella*, Gould.
6. *Crania japonica*, Gould.
7. *Terebratulina caput-serpentis*, Linné.
8. —— ——, var. *japonica*, Sow.
9. —— ——, var. *cumingii*, Dav.
10, 11, 12. *Terebratula minor*, Philippi, = *T. davidsoni*, Adams.
13. *Terebratella spitzbergensis*, Dav. Fig. 13 *a*, enlarged.
14, 14*a*. Ditto ditto, interior of ventral valve, enlarged.
15, 16, 17. *Terebratella mariæ*, A. Adams. Figs. 15 *a*, 16 *a*, enlarged; fig. 17, interior, enlarged.
18–22. *Laqueus rubella*, Sow. Fig. 20, a young specimen; figs. 21 and 22, *L. suffusa*, Dall, his original figures.
23–24. *Magasella adamsi*, Dav. Figs. 23 *a*, 24 *a*, enlarged.

Plate XXXI.

Figs. 1, 2. *Megerlia sanguinea*, Chemn. Figs. 2, 2 *a*, interior of dorsal valve, enlarged.
3. —— ——, var. *M. reevei*, Adams.
4, 5. *Terebratella coreanica*, Adams and Reeve.
6. *T.* —— ?
7, 8. *Waldheimia grayi*, Dav., and var. *transversa*, Gould.
9. —— *raphaelis*, Dall.
10. —— *picta*, Chemnitz.
11. *Magasella gouldi*, Dall, MS. Fig. 11, *a*, *b*, *c*, enlarged.
12. *Rhynchonella psittacea*, Gmel., var. *woodwardi*, A. Adams.
13, 14. —— *lucida*, Gould.

2. On a new Species of Long-tailed Titmouse from Southern Europe. By R. B. Sharpe, F.L.S., Librarian to the Society, &c., and H. E. Dresser, F.Z.S. &c.

[Received April 4, 1871.]

In a paper published in 'The Ibis' for 1868 (p. 295), Sharpe drew attention to the differences existing between the Long-tailed Titmice of Great Britain and Scandinavia, and gave a synopsis of the known species, six in number. At that time it was very uncertain whether the bird found in Spain was identical with the British species or not. We have lately received from our friend Major Irby a series of specimens killed near Gibraltar, and we can now safely affirm that the Spanish Long-tailed Titmouse constitutes a new and entirely distinct species, which we propose to call

Acredula irbii, sp. nov.

A. *dorso pulchre cinereo unicolori, parte superiore et uropygio paullulum roseo tinctis: capite laterali et collo postico nigerrimis:*

pileo summo albido: genis albidis, brunneo striolatis: gutture albo: pectore roseo, parte superiore punctulis parvis brunneo notata.

Long. tot. 4, culm. 0·3, al. 2·15, caud. 2·15, tars. 0·6, poll. et dec. Angl.

Hab. Southern Spain (*Irby*); Piedmont (*Salvadori*).

The present species is closely allied to *Acredula rosea* of England, but has the back blue-grey instead of black; the black bands on each side of the head are very broad and distinct, and the central white streak is proportionally narrow. We have named this species after Major Irby, well-known for his ornithological researches in India. We shall be able to show that during his residence in Andalucia he has exhibited no less energy; for he has forwarded to us a series of notes on all the birds of this country for publication in the 'Birds of Europe.'

The *Acredulæ* may thus be enumerated:—

1. *Acredula caudata* (L.). *Hab.* Scandinavia and the Northern Palæarctic Region generally.
2. *Acredula rosea* (Blyth). *Hab.* British Islands and probably France and the Netherlands.
3. *Acredula irbii*, S. & D. *Hab.* Southern Europe.
4. *Acredula trivirgata* (T. & S.). *Hab.* Japan.
5. *Acredula glaucogularis*, Gould (*A. swinhoii*, Pelz.). *Hab.* China.
6. *Acredula tephronota*, Günth. *Hab.* Asia Minor.

3. Contributions to the Ornithology of Madagascar.—Part II.

By R. B. SHARPE, F.L.S., Librarian to the Society, &c.

[Received April 4, 1871.]

(Plate XXXII.)

Mr. Crossley, whose excellent collections formed the basis of my former communication on this subject (P. Z. S. 1870, p. 384), has lately returned to England, bringing with him another consignment of natural-history specimens, amongst which are several fine birds. These have been submitted to me in due course by Mr. Cutter, of Great Russell Street; and the accompanying notes embody my observations on them. I may premise my description of the birds included in it by a few remarks relating to some of the species mentioned by me in my former paper, as some of the specimens now sent by Mr. Crossley afford us additional information respecting them. The numbers now mentioned refer to those prefixed to the various birds in the former article.

1. HYPSIPETES OUROVANG.

This bird should stand as *H. madagascariensis* (Müll.); *cf.* Gray's Hand-l. of B. i. p. 272, and Sharpe's Cat. Afr. B. p. 21.

2. TYLAS EDUARDI.

Tylas eduardi, Hartl.; Sharpe, Cat. Afr. B. p. 385.

Several specimens of this bird are in the collection just received. They differ somewhat in coloration, some examples having white marks on the throat and the bill of a yellowish horn-colour, the upper plumage being more tinged with brown. I believe these to be younger birds, as one of my specimens, evidently quite adult, has the throat jet-black like the rest of the head.

7. CEBLEPYRIS MAJOR.

Ceblepyris major, Sharpe, P. Z. S. 1870, p. 389.
Campephaga major, Sharpe, Cat. Afr. B. p. 53.

Additional specimens of this Shrike confirm the distinctness of the species from *C. cana*.

15. MYSTACORNIS CROSSLEYI.

Mystacornis crossleyi, Sharpe, P. Z. S. 1870, p. 392, pl. xxix., et Cat. Afr. B. p. 20.

Mr. Crossley, on seeing the plate of this species, was not a little astonished to find the birds placed on reeds, a locality never affected by the species at all. He told me that they ran along the ground in the thick forest, and were shot for him by the natives with blow-pipes; so in my recently published Catalogue I relegated the genus *Mystacornis* to the family *Timaliidæ*, of which family there are certainly some forms present in the Æthiopian region. The reason that I originally referred the genus *Mystacornis* to the family *Sylviidæ* was the fact of M. Grandidier having originally placed the typical species in the genus *Bernieria*, which I was always inclined to consider, along with *Tatare*, a Sylviine form closely allied to *Calamoherpe*. I had not at that time carefully noticed the remarks published by Mr. Edward Newton (Ibis, 1863, p. 343) to the effect that the first specimen of *Bernieria* which he obtained was seen "hopping about in a thicket," while the second example was "also among some thick bushes." It seems therefore that *Bernieria* and *Mystacornis* are not reed-birds at all; and I suppose that *Tatare* will prove to be a forest form also. Mr. George Robert Gray, in the 'Hand-list' (vol. i. p. 194), places *Tatare* in a subfamily, *Tatarinæ*, G. R. Gr., at the end of the family *Troglodytidæ*, while *Bernieria* he places in his comprehensive genus *Criniger*, near to *C. syndactylus* (*Xenocichla syndactyla*). I believe that this is probably the correct position of *Bernieria*, viz. close to *Xenocichla*, but that *Tatare* and *Mystacornis* must certainly follow.

It will be noticed that Mr. Edward Newton (*l. c.*) says that the native name for *Bernieria madagascariensis* and *B. minor* were the same, "Tra-trak," and adds, "My people could not detect the difference, and called them both by the same name." During his recent visit to England, M. Jules Verreaux mentioned to me in the course of conversation that M. Grandidier had taken great pains to investigate the subject, and had assured himself that these two supposed species were nothing more than sexes of the same bird, the large one being the male.

In the last collection brought home by Mr. Crossley was a specimen of a *Mystacornis* which I suppose must be the young bird; but it differs from the ordinary species in being of a dull sienna underneath and in having the head and neck of this colour also. It might very well be taken for a distinct species, but for the fact that in the female specimen already in my collection there is a slight tint of rufous on the crown.

37. CORETHRURA INSULARIS. (Plate XXXII.)

Corethrura insularis, Sharpe, P. Z. S. 1870, p. 300.

Crex jardinei, Verr. in Vins. Voy. Madag. Ann. B. p. 4 (1865); Schl. & Poll. Faun. Madag. Ois. p. 161 (1868).

In the last collection sent, there are some males of this species which clearly show that the bird is distinct from *Corethrura jardinii* and other species of *Corethrura*, as I had expected it to be. It is probably the *Crex jardinii* of Messrs. Verreaux and Schlegel; but it is to be distinguished from the last-named species by its much larger size and red throat. I subjoin a description of the adult male.

Head, throat, and breast rich chestnut; sides of the neck black, margined with white on each side of the feather, producing a streaked appearance; centre of the back and scapulars black, streaked like the sides of the neck, but with yellowish margins to the feathers instead of white; wing-coverts black, all the feathers margined with whitish; quills brownish black, irregularly varied with yellowish on the outer primaries; the secondaries deep black, irregularly streaked and spotted with rufous white; tail deep chestnut; belly black, longitudinally streaked with white, the abdomen and vent brownish; under tail-coverts chestnut, like the tail; bill black; feet yellowish brown.

Total length 6·2 inches, culm 0·5, wing 2·8, tail 1·9, tarsus 0·75, middle toe 1·15.

The following is a list of the additional species not before mentioned by me.

Family CYPSELIDÆ.

41. CYPSELUS GRACILIS, sp. n.

Cypselus parvus et *C. unicolor*, auct., ex Madagascar.

C. *æneo-niger: genis cum colli lateribus et corpore subtus umbrino-fuscis: gutture paullo albicante, indistincte striato.*

Long. tot. 6·2, alæ 4·95, caudæ 2·1, rect. ext. 3·2, med. 2·1.

There can be little doubt that the Madagascar Swift above described is not identically the same as the continental bird. It is in every respect much darker, and the fork of the tail is not so long. The specimen described appears to me to be the oldest of the three brought home by Mr. Crossley, who has not attached any label of the exact locality to these specimens. They were a few which he brought with him on his return among his personal baggage, as the greater part of his collection was so unfortunate as just to reach

Paris as the investment of the city was completed, and the cases were shut up during the whole of the siege. Luckily no injury was done to any of the specimens.

Another example of this Swift only differs from the one described in having a few scarcely discernible edgings to the back-feathers, while the throat is distinctly mottled with black and white; another, seemingly younger, has the edgings to the dorsal feathers very distinct, and the whole of the throat white varied with little black markings.

I transcribe Dr. Sclater's description of *C. parvus* (from his paper in P. Z. S. 1865, p. 601) for the sake of comparison with that of the Madagascar bird.

> "*Murino-fuscus, gutture albido fusco striolato: alis et cauda æneo tinctis: cauda profundissime furcata: long. tota* 7, *alæ* 5·4, *caudæ* 1·4, *rect. ext.* 4, *med.* 1·4."

Compared with the Madagascar skins these West-African examples are always very much paler in colour, rather stouter in form, and have the tail more conspicuously forked.

Family CORACIIDÆ.

Subfamily BRACHYPTERACIINÆ.

42. GEOBIASTES SQUAMIGERA.

Geobiastes squamigera (Lafr.); Sharpe, Ibis, 1871, p. 186; *id.* Cat. Afr. B. p. 5 (1871).

One specimen, the same mentioned in my paper on the African *Coraciidæ* (Ibis, 1871, p. 184), and on which I founded the genus *Geobiastes.*

Family TURDIDÆ.

43. COSSYPHA IMERINA.

Cossypha imerina, Hartl. Faun. Madag. p. 43 (1861); Verr. in Vins. Voy. Madag. Ann. B. p. 2 (1865); Schl. & Poll. Faun. Madag. p. 158 (1868).

Cossypha emerina, Grand. Rev. et Mag. de Zool. 1867, p. 359.

"Saralalan, January 28, 1870, February 1, 1870. Nossi Vola, February 1, 1870. Native name *Vorun poottat.*"

In his well-known 'Ornithologischer Beitrag zur Fauna Madagascars,' Dr. Hartlaub first described this pretty species, from an example brought home by Professor Peters from St. Augustine's Bay, and preserved in spirits in the Berlin Museum. The birds which Mr. Crossley has forwarded agree in the main with the original description; but as no mention is made of the colouring of the tail, which forms one of the most distinctive characters, I cannot guarantee the absolute correctness of my identification. For the better settlement of the matter, therefore, I subjoin a detailed description of old and young birds, examples of both of which are contained in Mr. Crossley's last consignment. I may mention that in his first collection an adult specimen was forwarded by him, which passed into the National collection. Mr. G. R. Gray was inclined to consider it undescribed; but I am not aware that he has published any description either of this or of a beautiful new Goatsucker, also discovered by Mr. Crossley and purchased a year ago by the British Museum.

Adult. Above dull grey, the rump tinged with rufous, the upper tail-coverts being entirely of this latter colour; the cheeks, forehead, and eyebrow clearer grey, inclining to blue; the lesser wing-coverts dull grey like the back, the rest of the wing-coverts greyish black, as also are the quills, which are pale rufous on the base of the inner web; tail rufous, tipped with black, the two middle feathers being entirely black; throat and breast blue-grey, lower part of the breast, sides of the body, and the under wing- and tail-coverts orange-rufous; bill and legs greyish black, the soles of the feet yellowish. Total length 6 inches, culm 0·65, wing 2·9, tail 2·3, tarsus 0·85.

Young. Olive-brown, everywhere striped and spotted with ochre, the shaft of each feather being marked with an ochre stripe broadening out towards the tip into an apical spot, which is also margined with black; rump mottled with rufous; upper tail-coverts entirely rufous; wing-coverts mottled like the back; quills glossy brownish black, edged with rufous; tail rufous, the feathers shaded with brown towards the tip, the middle feathers brownish, edged with rufous; under surface of the body yellowish brown mottled with ochre, each feather being margined with blackish; the abdomen only slightly marked with black edgings to the feathers. Total length 6 inches, culm 0·65, wing 2·85, tail 2·1, tarsus 0·9.

Another specimen, apparently a little older, has a few grey feathers appearing here and there on the head and throat; and the breast is losing the mottled appearance and becoming entirely orange; so that it will be seen that the phases of plumage assumed by the bird are very similar to those of our common Robin (*Erithacus rubecula*). Apparently all *Cossyphæ* go through the same changes, as I have a series of the common *C. caffra* which exhibit like phases of dress.

Family NECTARINIIDÆ.

44. NECTARINIA NOTATA.

Certhia notata, P. L. S. Müll. Naturh. Anhang, p. 99. no. 32 (1766, ex Buff.); Walden, Ibis, 1870, p. 25.

Nectarinia angaladiana, Hartl. Faun. Madag. p. 52; Roch & E. Newt. Ibis, 1862, p. 273; Sclater, P. Z. S. 1863, p. 162; E. Newt. Ibis, 1863, p. 343; A. Newt. P. Z. S. 1865, p. 834; Verr. in Vins. Voy. Madag. Ann. B. p. 2 (1865); Grand. Rev. et Mag. de Zool. 1867, p. 355; Schl. & Poll. Faun. Madag. Ois. p. 69 (1868); Sharpe, Cat. Afr. B. p. 38 (1871).

Two specimens from Saralalan.

Family PARIDÆ.

45. HYPHERPES CORALLIROSTRIS.

Hypherpes corallirostris, A. Newt. P. Z. S. 1863, p. 85, pl. 13; E. Newt. Ibis, 1863, p. 342.

Sitta (!!) *corallirostris*, Schl. & Poll. Faun. Madag. p. 158 (1868).

a, b. "Saralalan. Tree-climber."

Mr. Crossley has sent two specimens of this most interesting bird. It is difficult to assign a place for this genus, though it seems to me to be somewhere between the *Paridæ* and *Sitta*; but it is remarkable for the extraordinary development of the hind toe, which exceeds the tarsus in length. It is certainly one of the most curious birds extant.

Family MUSCICAPIDÆ.

46. PSEUDOBIAS WARDI.

Pseudobias wardi, Sharpe, Ibis, 1870, p. 498, pl. xv.

Pseudobiastes wardi, Sharpe, Cat. Afr. B. p. 43 (err.).

This bird was described by me (*l. c.*) as the type of a new genus *Pseudobias*, which, by a *lapsus calami*, I wrote *Pseudobiastes* in my catalogue.

Family LANIIDÆ.

47. ARTAMIA LEUCOCEPHALA.

Artamia leucocephala (Gm.); Hartl. Faun. Madag. p. 47 (1861); Sclater, P. Z. S. 1863, p. 162; E. Newt. Ibis, 1863, p. 348; Verr. in Vins. Voy. Madag. Ann. B. p. 2 (1865); A. Newt. P. Z. S. 1865, p. 834; Grand. Rev. et Mag. de Zool. 1867, p. 355; Schl. & Poll. Faun. Madag. Ois. p. 83 (1868); Sharpe, Cat. Afr. B. p. 52 (1871).

Oriolia bernieri, Is. Geoff. St.-Hil.; Hartl. Faun. Madag. p. 43 (1861); Verr. in Vins. Voy. Madag. Ann. B. p. 2 (1865).

Artamia bernieri, Schl. & Poll. Faun. Madag. Ois. p. 86, pl. 25 (1868); Sharpe, Ibis, 1870, p. 214.

"Saralalan."

Oriolia bernieri is only the young of this species, as I am informed by my friend M. Jules Verreaux. I have in my collection a specimen which still retains the remains of rufous barring on the feathers.

48. VANGA CURVIROSTRIS.

Vanga curvirostris (Gm.); Hartl. Faun. Madag. p. 51 (1861); Roch & E. Newt. Ibis, 1862, p. 274; Sclater, P. Z. S. 1863, p. 162; E. Newt. Ibis, 1863, p. 348; A. Newt. P. Z. S. 1865, p. 835; Verr. in Vins. Voy. Madag. Ann. B. p. 2 (1865); Grand. Rev. et Mag. de Zool. 1867, p. 387; Schl. & Poll. Faun. Madag. Ois. p. 99 (1868); Sharpe, Cat. Afr. B. p. 50 (1871).

"Saralalan. Native name *Vorun-banga*."

Mr. Crossley has sent three examples of this species, all of which differ from the other specimens in my collection by being grey on the under surface, and on the collar which surrounds the neck, instead of pure white. It is evident, however, that these specimens are only the young birds; and I therefore subjoin a description of one of them, as I believe this state of plumage has not previously been described.

Head black, varied on the forehead and crown with grey;

lores and cheeks greyish white; entire back black; wing-coverts black, a few of the lesser ones tipped with greyish white, the greater ones externally margined with white towards the tip, forming a very broad alar bar; one of the feathers slightly tipped with rufous; primary coverts black; quills blackish, the primaries externally margined near their base with fulvous white, merging into grey; two of the dorsal secondaries externally margined with white; tail grey for the basal and black for the apical half, all the feathers tipped with white; a collar round the back of the neck and the under surface of the body grey, becoming white on the throat and lower abdomen; thighs grey; under wing- and tail-coverts white.

Another specimen is very similar to the one above described, but has all the fore part of the head greyish white, the shafts of the feathers only being marked with black; the collar round the neck and under surface of the body are clearer grey; and most of the secondaries are edged with white, some of them very conspicuously.

This species must be some little time attaining the full plumage.

49. VANGA RUFA.

Artamia rufa (Gm.); Hartl. Faun. Madag. p. 48 (1861); A. Newt. P. Z. S. 1865, p. 835; Verr. in Vins. Voy. Madag. Ann. B. p. 2 (1865).

Pachycephala rufa, Schl. & Poll. Faun. Madag. Ois. p. 86, pl. 26 (1868).

"Saralalan."

This bird appears to me to be a small species of *Vanga*, differing only in the bill being a little less compressed. It certainly is not a true *Pachycephala*, in which genus Professor Schlegel has placed it; nor is it an *Artamia*, as it differs at once from this genus by the position of the nostrils, which in *Artamia* are placed far beyond the plumes and are unprotected; whereas in *Vanga* the nostrils are thickly protected with bristles, and are placed at the base of the frontal plumes. The shape of the bill also in the two genera is quite different.

Family PLOCEIDÆ.

50. FOUDIA MADAGASCARIENSIS.

Foudia madagascariensis, L.; Hartl. Faun. Madag. p. 55; Roch & E. Newt. Ibis, 1862, p. 275; E. Newt. Ibis, 1863, p. 350; A. Newt. P. Z. S. 1865, p. 836; Verr. in Vins. Voy. Madag. Ann. B. p. 2 (1865); Grand. Rev. et Mag. de Zool. 1867, p. 388; Sharpe, Cat. Afr. B. p. 62 (1871).

Ploceus madagascariensis, Schl. & Poll. Faun. Madag. Ois. p. 109 (1868).

Several specimens in Mr. Crossley's last collection.

Family RALLIDÆ.

51. PORZANA PYGMÆA.

Porzana pygmæa (Naum.); Hartl. Faun. Madag. p. 81 (1861);

E. Newt. Ibis, 1863, p. 458; Verr. in Vins. Voy. Madag. Ann. B. p. 4 (1865); Schl. & Poll. Faun. Madag. Ois. p. 160 (1868).

One specimen in Mr. Crossley's last collection. Mr. Plant sent a quantity of this species in one of his consignments.

4. Description of a new Percoid Fish from the Macquarie River. By Dr. A. Günther, F.Z.S.

[Received April 12, 1871.]

(Plate XXXIII.)

The British Museum has recently received an example of an undescribed Percoid Fish from the Macquarie River, which, although allied to *Lates* and *Oligorus*, may be regarded as the type of a distinct genus, to be characterized thus:—

Ctenolates.

Seven branchiostegals; pseudobranchiæ well developed. All the teeth villiform, in bands; teeth on the palatine bones as well as on the vomer; tongue smooth. The spinous dorsal fin is continuous with the soft, and composed of ten strong spines; three anal spines. Operculum with a flat spine; præoperculum finely serrated behind, and with small denticulations on the lower limb; præorbital serrated. Scales small, strongly ctenoid. [Pyloric appendages ? *]

Ctenolates macquariensis. (Plate XXXIII.)

B. 7. D. $\frac{10}{11}$. A. $\frac{3}{8}$. L. lat. 72. L. transv. 12/28.

The height of the body is two-fifths of the total length (without caudal), the length of the head one-third. The upper profile is very convex above the nape, and deeply concave above the occiput. Mouth of moderate width, the maxillary extending to below the middle of the eye. Mandible prominent. The diameter of the eye is one-half of the extent of the snout, and one-fourth of the postorbital portion of the head. Scales on the cheek numerous, only half the size of those of the operculum. The denticulations of the lower præopercular limb are small, irregularly arranged, directed forwards. Dorsal spines strong, the fourth the longest, one-third of the length of the head; the ninth and tenth are equal in length, much shorter than the rays. Anal spines very strong. Caudal fins slightly rounded. Pectoral nearly half as long as the head, rounded. Greenish grey, silvery below.

Total length 12 inches.

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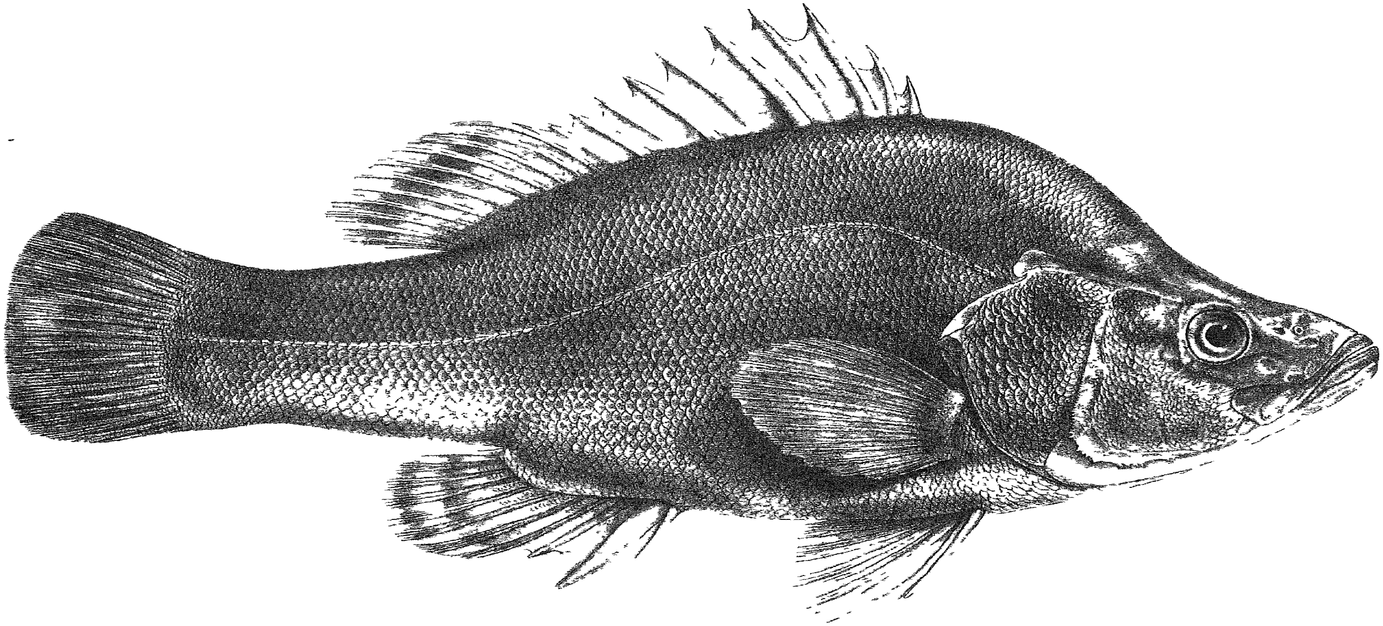
[*] The intestines have been unfortunately removed by the collector.

P Z S 1874 Pl XXXIII



G H Ford

CTENOLATES MACQUARIENSIS

Mintern Bros imp

5. Descriptions of two new Species of Land-Shells from the Bellengen River, New South Wales. By J. BRAZIER, C.M.Z.S.

1. HELIX BELLENGENENSIS, sp. nov.

Shell umbilicated, depressedly orbicular, nearly discoid, rather thin, radiately striated; between the raised striæ very finely punctured, dark chestnut, and covered with a fine silky epidermis; whorls 4½, moderately convex, rather flattened at the suture, keeled at the periphery; base convex, rather finely striated; aperture subquadrately ovate; peristome white, in some specimens of a faint pink tinge, moderately reflected; margins approximating, the upper descending in front; columellar portion partly covering the deep umbilicus.

Diameter—greatest 4½ lin., least 4, alt. 2½ lin.

Hab. Manarm Creek, Bellengen River. (*coll. Brazier*); very rare.

This fine rare species I found on standing dead trees (*Eucalypti*), under the bark five feet from the ground. I also obtained a few under logs on the ground; it likes very wet places.

2. BULIMUS LARREYI, sp. nov.

Shell imperforate, ventricose, ovate, very thin, transparent, transversely and finely marked with dark interrupted lines; apex obtuse; whorls 4 to 4½, convex, last equalling more than one-half of the entire length; suture slightly grooved; below the suture an interrupted yellowish band tessellated with dark spots; aperture oval, interior glossy; peristome simple, acute; columella slightly recurved and reflected.

Length 1 inch 2 lin., breadth 6 lin.; aperture 6¼ lin., width 4 lin.

Hab. Manarm Creek, Bellengen River, under burnt logs; very rare (*coll. Brazier*).

This interesting and new species of *Bulimus* differs from any of our known species in being of so light and inflated a form, and in the characteristic tessellated black spots at the suture. The first specimen that I obtained of it was on my recent tour to the Bellengen, called by some Bellenger and Billinger River, two hundred miles to the north of Sydney: it was collected by my intelligent aboriginal guide King Larrey. During my stay of two months we only found four specimens; since my return to Sydney I have received two more from him.

The animal is of an umber colour, full of wrinkles, with three black stripes, one from each tentacle, and one down the centre of the back, running longitudinally.

6. Notes on recently described Shells.

By J. BRAZIER, C.M.Z.S.

1. DOLABRIFERA BRAZIERI.

Dolabrifera brazieri, Sowerby, Proc. Zool. Soc. 1870, p. 250.

Hab. Northhead, Botany Bay, on the south-east coast of Australia. Mr. Sowerby unfortunately places Botany Bay on the south-west coast. Since I obtained the two specimens that Mr. Sowerby mentions, I have obtained six more at the Bottle-and-Glass Rocks, Port Jackson. The animal at present I have not examined.

2. HELIX (TROCHOMORPHA) FESSONIA.

Helix (Trochomorpha) fessonia, Angas, Proc. Zool Soc. 1869, p. 626, pl. 48. fig. 7.

Trochomorpha transarata, Mousson, Journal de Conch. 1870, part i. p. 121, pl. 7. fig. 1.

Hab. Kantavu, Fiji Islands, on trees (*Brazier*); interior of Viti Levu, or Great Fiji (*Gräffe*).

3. HELICINA (TROCHATELLA) TECTIFORMIS.

Helicina tectiformis, Mousson, Journal de Conch. April 1, p. 199, pl. 8. fig. 7.

Helicina mangoënsis, Sowerby, Proc. Zool. Soc. April 28, 1870, p. 250.

Hab. Mango Island, Fijis (*Brazier*).

I presume that this species, described by M. Mousson, was also obtained at Mango by Gräffe.

4. HELICINA PLICATILIS.

Helicina norfolkensis, Pfeiffer, Proc. Zool. Soc. 1856, p. 391; Pfr. Mon. Pneu. Vivent. suppl. 1, p. 189, and suppl. 2, p. 220; Sowerby, Thes. Conch. vol. iii. p. 292, figs. 373 & 374.

Helicina plicatilis, Mousson, Journal de Conch. 1865, p. 178.

Hab. Upolu, Navigator's Islands; found inland on trees (*Brazier*).

No *Helicina* has been found on Norfolk Island up to the present time, and the locality given to this species by the late Mr. H. Cuming is incorrect. I visited that island seventeen years ago, and a second time only six years ago. There are only two operculated species found on it, *Palaina coxi*, H. Adams, and *Omphalotropis ceres*, Pfr.

5. COLUMBELLA (MITRELLA) ANGASI.

Columbella interrupta, Angas, Proc. Zool. Soc. 1865, p. 56, pl. 2. figs. 9 & 10.

Hab. Shark Island, Port Jackson (*coll. Brazier*); York's Peninsula, South Australia (*Mr. G. F. Angas*); Hobart Town, Tasmania (*W. F. Petterd*).

Mr. Gaskoin described a *Columbella interrupta* in Proc. Zool. Soc. 1851; as the species described by Mr. Angas requires a fresh name, I have called it after him.

7. Descriptions of new Species of Land and Marine Shells from Australia and the South-Western Pacific. By JAMES C. COX, M.D., C.M.Z.S.

[Received March 22, 1871.]

(Plate XXXIV.)

HELIX ALFREDI, sp. nov. (Plate XXXIV. figs. 1, 1 *a*.)

H. *testa imperforata, depresso-globosa, glabra, nitida, polita, nigro-brunnea, duabus fasciis opaco-albis ornata, una ad peripheriam, altera infra suturam; spira late conica; anfractibus quinque, lente accrescentibus, planiusculis, ultimo antice deflexo; apertura semiovali; peristomate albo, simplici, breviter reflexo; columella dilatata, appressa.*

Diam. maj. 0·93, min. 0·82, alt. 0·85 unc.

Hab. Solomon Islands (*Coll. Hargraves*).

This will add another to the large number of beautiful species which have recently been obtained from this group of Islands. It is unlike any other species which I have seen; easily recognized by its black-brown polished appearance, banded by two strongly contrasting broad white opaque bands.

I have named this species in honour of Capt. H.R.H. The Duke of Edinburgh, from whom I received during his late visit to this colony some valuable species of shells from his private collection.

HELIX MILLICENTÆ, sp. nov. (Plate XXXIV. figs. 2, 2 *a*.)

H. *testa imperforata, depresso-globosa, tenui, nitida, obsolete carinata, undique rugoso-granulata; spira elevata, pallide castanea, fascia alba ad peripheriam et flammulis opaco-albis undique ornata; anfractibus quinque, parum convexis, ultimo antice deflexo; apertura subangulata, lunato-circulari; peristomate expanso, albo, breviter reflexo, marginibus conniventibus; columella dilatata.*

Diam. maj. 0·98, min. 0·80, alt. 0·75 unc.

Hab. Louisiade Islands (*Coll. Cox*).

A rather thin, delicate, handsome species, having the general form of *H. fringilla*, but being at once distinguished from it by its coarse wrinkled granular surface and by the absence of the tooth-like projection of the peristome near the columella.

BULIMUS HARGRAVESI, sp. nov. (Plate XXXIV. fig. 3.)

B. *testa perforata, fusiformi-oblonga, tenuicula, lævi, longitudinaliter subtiliter striata, transversim striis rugato-crassis, obtectis, sub epidermide lutescente alba, maculis triangularibus olivaceo-fuscis generaliter picta; spira oblongato-conica, nuda, apice acutiuscula, rosea, granulata; anfractibus* 6, *convexis, ultimo* $\frac{2}{3}$ *longitudinis æquante; apertura verticali, elongato-auriformi, intus albida, nitida, marginibus crassatis, reflexis, albidis, callo non junctis; margine collumellari dilatato, superne callo adpresso,* *perforationem obtegente, intus basi usque ad apicem lira albida spiraliter ductante.*

Diam. 1·05, long. 2·60 unc.

Hab. Treasury Island, Solomon Islands (*Coll. Cox*).

As a rule this species varies very little; of the several examples which I possess, however, some are shorter or wider than the typical specimens, while others are much lighter in colour and not so decidedly rosy at the apex.

VOLUTA KINGI, sp. nov. (Plate XXXIV. fig. 4.)

V. *testa oblongo-ovata, crassa, ponderosa; spira brevi, acuminata, apice vix papillari; anfractibus lævibus, superne declivibus, deinde tumido-angulatis; columella quadriplicata; apertura longiuscula; labro simplici, fusco-flavida aut fulvo, polito; columella et aperturæ fauce intense aurantio tincta.*

Diam. 1·40, long. 3 unc.

Hab. King's Island, Bass's Straits.

Several fine specimens of this new species have lately been obtained; it has the form of the shorter specimens of *Voluta angasi*, but it is a more ponderous shell, and at once distinguished by its polished exterior and dark orange-coloured interior.

VOLUTA CONIFORMIS, sp. nov. (Plate XXXIV. fig. 5.)

V. *testa oblongo-pyriformi vel coniformi, solida; spira brevissima, obtusa; anfractibus longitudinaliter regulariter fortiter striatis, et transverse striatis cum lineis fortiter undulatis; columella quadriplicata, plicis transversis et parvis; apertura subangustata, prope spiram longiuscula, ascendente; intus violaceo-brunnea; labro simplici; fulvescenti-brunnea, obscure trifasciata, fasciis valde trigono-reticulatis, et maculis irregulariter ornata.*

Diam. 1·40, long. 2·80 unc.

Hab. Nichol Bay, N.W. Australia.

So far only a single specimen of this fine species has been obtained. Its solid *cone-like* form, obtuse and rounded spire, and in particular its peculiar sculpturing by regular longitudinal striæ, decussated at right angles by coarser waved striæ, will at once distinguish it from any other described species. In my opinion this species will create a well-marked subgenus of *Voluta*.

VOLUTA PUNCTATA, Reeve. (Plate XXXIV. fig. 6.)

Hitherto this rare shell has been very indifferently represented in the various works illustrating conchology. As I have lately added to my collection many fine specimens of this species, I send you one to figure. The regular rows of square dark orange spots with which this species is represented in Reeve's 'Conc. Icon.' (Dec. 1849) from a broken and worn specimen in the British Museum are not to be depended upon, being more frequently absent than otherwise; they are, as a rule, scattered irregularly over the surface of the shell.

This species has rather a wide range on the east coast of Australia, my specimens having been collected from various localities between

Port-Jackson Heads and the mouth of the Clarence River; and it probably ranges further north.

DESCRIPTION OF PLATE XXXIV.

Figs. 1, 1*a*. *Helix alfredi*, p. 323.	Fig. 4. *Voluta kingi*, p. 324.
2, 2*a*. —— *millicentæ*, p. 323.	5. —— *coniformis*, p. 324.
3. *Bulimus hargravesi*, p. 323.	6. —— *punctata*, p. 324.

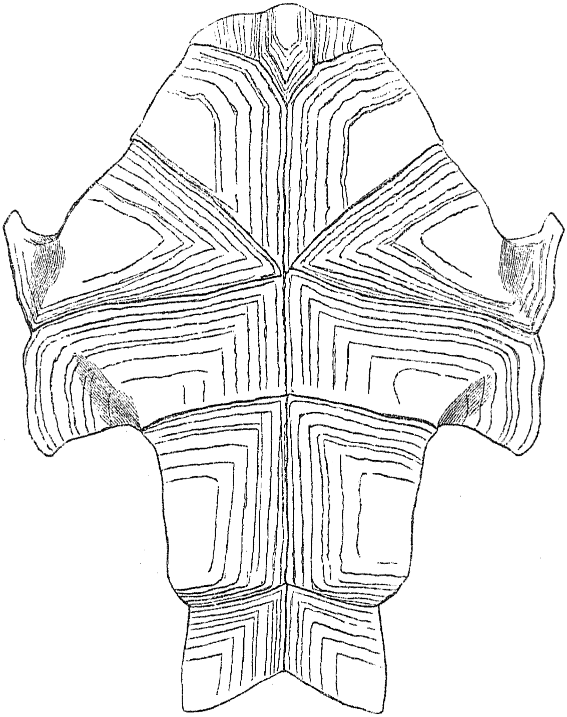
May 2, 1871.

The Viscount Walden, President, in the Chair.

Mr. Sclater exhibited the shell of a River-tortoise of the genus *Pelomedusa* from the Upper Zambesi, and made the following remarks upon it:—

"Mr. E. L. Layard has placed in my hands for examination the shell of a River-tortoise obtained on the Upper Zambesi by Mr. J. Chapman during his well-known expedition, which seems to indicate the existence in that district of a species of *Pelomedusa* more nearly allied to *P. gehafie* of Eastern Africa than to *P. galeata*, the common species of the Cape Colony. In *P. galeata* the two pectoral shields of the thorax unite in the middle line and form a suture which is nearly two-thirds of the length of the suture between the two abdominal shields. In *P. gehafie* the pectoral shields terminate on their inner sides in angular points, which do not meet together in the middle line, so that the brachial shields join on to the abdominal and entirely divide the pectorals from the middle line. This is shown well in Rüppell's figure (Neue Wirbelth. Amph. t. 1), in a living specimen of *P. gehafie* in the Society's collection, and in all the examples of this species that I have yet seen. In the present specimen, however, the pectorals come very nearly, if not quite, up to the median line; and there is also some difference in the shape of the other plates, the gulars and intergular being broader and not so deep. Under these circumstances I was inclined to think that the Zambesian *Pelomedusa* might be referable to a distinct species, especially looking to the very different locality. But Dr. Peters, who has been kind enough to compare the specimen with those of *P. gehafie* in the Berlin Museum, finds amongst the latter one from Sennaar which approximates to the Zambesian example in the pectorals running nearer together, so that I am not willing to found a new species upon a single shell.

"It would be advisable, however, that more examples of the *Pelomedusa* of the Upper Zambesi should be obtained, and further comparisons made, as the extension of a species hitherto considered to be restricted to Abyssinia and Sennaar so far south is certainly a noteworthy although not unprecedented fact.



Sternum of *Pelomedusa* from the Zambesi (nat. size).

"On the *Lower* Zambesi Dr. Peters found *P. galeata*, the common species of the Cape Colony (with which *P. nigra*, Gray, of Natal, is, in my opinion, identical*) abundant."

The following (twelfth †) letter on the ornithology of Buenos Ayres, addressed to the Secretary by Mr. W. H. Hudson, C.M.Z.S., was read:—

"Buenos Ayres, September 22, 1870.

"Dear Sir,—As I have so far always made the species that interested me most at the moment of writing the subject of my letters, I will now say something of the Swallows of this country; for these ever welcome little emigrants are at present hourly arriving and scattering themselves far and wide over the plains of Buenos Ayres.

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* See also Strauch, Mém. Ac. St. Pétersb. ser. 7, vol. viii. p. 111.

† See *anteà* p. 258, for eleventh letter.

"The *Hirundo leucorrhoa* is the most common of our Swallows, and in its glossy coat of deep blue and green, with rump and under-plumage snowy white, is an elegant and beautiful bird. They are the last of all the migratory species to leave us in autumn, and invariably reappear in small numbers on every warm day in winter, so that some people do not believe that they leave us at all, but only retire to the more sheltered places when the weather is severe. In the winter of 1869 I saw three of them skimming over the plain on one of the coldest days I have ever experienced; the thermometer having stood at 29° Fahr. the preceding evening. But those that remain through the winter with us are apparently only a few individuals, while in the autumn myriads are seen passing north in their migration, and some years continue passing for upwards of a month. In April 1869, several days after all the Swallows of our five species had totally disappeared, flights of the kind I am describing began again to appear passing north; and for ten days afterwards they continued to pass. They would descend to sip water from a pool where I watched them, alighting afterwards on the reeds and bushes to rest. Many of them appeared quite tired with their journey, rising reluctantly when approached, and some allowing me to stand within two yards of them without flying. I had never before observed any supplementary or later migration like this; and last autumn (1870) certainly nothing of the kind took place. Probably the migration of this species extends very far south; at present they are passing in great numbers, and have been so passing for the last fifteen days.

"They sometimes build in a tree, in the large nest, previously abandoned, of the Señatero (*Anumbius acuticaudatus*). I have had occasion before, and shall have it again in descriptions of other species, to mention that interesting bird and its great nest.

"It is, however, under the eaves of houses that these Swallows principally breed; and there is not a house on the pampas, however humble it be, but some of these birds are about it, sportively skimming over and about the roof or curiously peering under the eaves and incessantly uttering their gurgling, happy notes. Indeed their fondness for being close to a house is so remarkably strong that in their longest excursions they are seldom more than five minutes absent from it.

"For a month or six weeks before they begin to build, they seem to be holding an incessant dispute; and however many eligible chinks and holes there may be, the contention is always just as great among them, and is doubtless referable to opposing claims to the best places. The excited twittering, the constant striving of two birds to alight on the same square inch of wall, and the chases they lead each other round and round the house, that always end exactly where they began, tell of clashing interests and great unreasonableness on the part of some among them. By-and-by the quarrel takes a more serious aspect; apparently every argument of which a Swallow is capable has been exhausted, and a compromise more impossible than ever, and so fighting begins. Most vindictively do the little things clutch each other, and tumble to the earth twenty times an hour, often struggling on the ground for a considerable time, and heedless of the screams of alarm their fellows set up above them; for often while they lie struggling do they fall an easy prey to some wily pussy, who thrives on their disputes. When these troubles and feuds are finally ended, they address themselves diligently to their great work, and build a rather large nest. They are not neat or skilful workers, but merely stuff a great quantity of straw and other light material into the hole they build in, and line it thickly with feathers and horsehair. The eggs are white and pointed, from five to seven in number.

"All those species that are liable at any time to become the victims of raptorial birds are much beholden to this Swallow, as he is the most vigilant sentinel they possess: often when the Hawk is still far off and the other birds unsuspicious of his approach, the Swallows suddenly rush up towards the sky with a wild rapid flight, announcing the evil tidings with distracted screams. These are well understood; and the alarm spreads like lightning through the feathered tribes, which are all in terrified commotion, crouching in the grass and plunging into thickets, or mounting upwards to escape by flight. I have often wondered at this; for surely this swift-winged little bird is the least likely to fall a prey himself.

"They have another habit which cannot but be grateful to the mind of every lover of nature who is an early riser. An hour before sunrise and ere any wild bird has broken the profound silence of night, multitudes of these Swallows, as at the signal of a leader, begin their song, at the same time mounting upwards into the still dusky sky. Their notes at this time are different from the hurried twitterings they utter through the day; they are impressive, and, though soft, may be heard at a long distance; sounding far and near, up in the sky, from so many throats, they have a most charming effect that seems in peculiar harmony with the shadowy morning twilight.

"We often see a Swallow here bearing a general resemblance to the *H. leucorrhoa*, but larger than that bird, without the blue and green reflections or colouring, and with a tinge of chestnut on the neck, rump, and sides.

"It does not breed or remain any time with us; but we see so much of it that it should, I think, have its place in our ornithology. I regret to say that I do not know its name or summer-home, not possessing any of those large works on South-American species that could probably enlighten me on the subject*. But even the necessarily imperfect notice I can give of it will perhaps enable you to determine its species. I have scattered through my papers numbers of notes on this Swallow, having observed it much to discover the direction of its flight; but I have always found it very irregular in its movements and times of appearing, also that it is vastly more numerous some years than others. Indeed sometimes a season passes without one individual being seen; other years they have only appeared very late in autumn. I find the following entries in an old note-book of mine:—'The first larger white-rumped Swallows I have seen this season appeared to-day (March 18, 1865); but a very few were visible, though the day was sultry and still.' 'They continued to pass every day, observing a north-easterly direction, until the 25th, when a storm came up from the south and cooled the air.'

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* This species may possibly be *Petrochelidon americana* (Gm.), (=*Hirundo pyrrhonota*, Vieill.).—P. L. S.

"But other years they have appeared in spring or early in summer, and, from the south-westerly direction to which they proceed at such times, I am inclined to believe that their summer habitat is in the mountain-region of Western Patagonia. It is remarkable that some years they have continued to pass all, or a greater part of, the hot season, and sometimes appear in vast numbers. Thus in the autumn of 1863 I had a good opportunity of observing them here, as every day thousands of them would descend to the stream near my house to glide over the surface, sip and dip themselves in the water in the manner common to all the Swallows. All the birds that arrived through the hotter part of the day would remain by the stream and congregate by thousands on the bushes; but two or three hours before sunset they would rise up and scatter about the sky and then proceed north or north-east; this continued for many days; and they have never since been so numerous.

"They do not, like other birds, when migrating proceed with a rapid flight in a straight line, but are always seen leisurely circling about the sky with a serene graceful flight, never in close flocks, but scattered about here and there—first one bird passing, a minute or so afterwards another, then two or three, and so on for a great part of the day.

"Their notes differ much from those of all our other Swallows—the birds incessantly uttering, as they circle about on high, a series of remarkable sounds resembling somewhat the creaking of the ungreased axle of a vehicle dragged along at a very slow rate of speed.

"In my next letter I will proceed to describe the other Swallows found in this neighbourhood."

Professor Flower, F.R.S., exhibited, and made remarks on, the mounted skeleton of the young Hippopotamus (*Hippopotamus amphibius*) recently born in the Society's Gardens, which had been prepared for the collection of the Royal College of Surgeons.

The skin of this specimen, which had been likewise mounted, was stated to have been placed in the Giraffe-house in the Society's Gardens for the examination of visitors.

The Viscount Walden, President of the Society, read a memoir on the birds of the Island of Celebes. Lord Walden commenced his paper with the following observations:—

"Situated in the midst of the vast collection of islands which contribute to form the Malay archipelago, Celebes possesses an avifauna of a type peculiar to itself. The geographical position of the island and the leading characteristics of its fauna have been so clearly explained and depicted by Mr. Wallace*, that it is almost unnecessary for me to add any observations of my own on these points.

"This great naturalist has shown that the principal and most striking peculiarity of the fauna of Celebes is its individuality—a generalization fully supported by the evidence furnished by its birds; and it is the chief object of this paper to give a list of all the birds authentically recorded as inhabitants of Celebes, and to show in some detail the zoogeographical relation of its genera and species.

"Our knowledge of the Celebean ornis has been principally derived from the discoveries of the Dutch travellers Forsten, Von Rosenberg, and Bernstein, and from those of Mr. Wallace. Yet although the Dutch naturalists and our great English traveller ransacked those parts of Celebes they traversed or resided in, they all more or less covered the same ground. The larger portion of the island (fully two-thirds of its area) still remains ornithologically unknown.

"All the species yet described from Celebes appear to have been obtained from the districts of Macassar and Bonthain in the south, and from the districts of Gorontalo and Minahassa in the north. That part of the island which stretches north from about the fifth parallel S. lat. to the Gulf of Tontoli, and west thence to Limbalto, the lesser of the two eastern limbs of the island, the whole of the south-east limb, and all the central country from which these limbs extend seem to have never been explored by an ornithologist.

"The group of islands of which Peling is the largest, and which are only separated from the Sula Islands by the Greyhound Straits, the Togian or Schildpad Islands in the Gulf of Tomini, the islands of Pagasane and of Bœton, the island of Saleyer, with its train of smaller satellites almost connecting Celebes with Flores, are nearly wholly unknown. The Sanghir Islands in the north, and the Sula Islands to the east, although as yet only partially investigated, have been shown to possess some species identical with those found in Celebes; consequently they have been regarded by recent authors as forming along with Celebes a separate zoological subarea. But I propose in the following list to include only those species of birds which are known to inhabit the island of Celebes itself. A more definite and more accurate idea of the peculiarities of the Celebean ornis will thus be presented than if genera which occur in the Sula Islands were placed side by side with Celebean genera. If we threw together the ornis of the Sula Islands with that of Celebes we shall find non-Celebean genera (such as *Criniger*, *Ceyx*, *Platycercus*, *Pachycephala*, and *Monarcha*) appearing in the list; and the really anomalous character of the Celebean avifauna actually existing on the main island would thereby be apparently greatly modified.

"Mr. Wallace (*op. cit.* i. p. 425) has estimated the number of known Celebean species of birds at one hundred and ninety-one. I have only been able to add two more to that number; yet there are doubtless many more species represented by Celebean examples in the museums of Europe. On the other hand, many species have been described as possessing a Celebean origin which most assuredly do not occur in the island.

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* Malay Archipelago, i. chap. xviii.

“To give a clear idea of the geographical relation of the Celebean avifauna I have thrown its one hundred and forty-nine genera into tables, and classed them according to the regions and subregions they may be said to belong to. The geographical character of a genus has been determined according to the area which possesses the preponderating number of species. Thus *Artamus* is classed as an Australian genus, because at least thirteen species of it occur within the Australian region, while one only is peculiar to the Indian; *Arachnothera* as an Indian genus, although one species is found in New Guinea.

“By means of these tables it will be seen that thirty-eight Indian genera occur in Celebes; of these, three are peculiarly Indo-Malayan.

“TABLE I.—Showing the Indian genera found in Celebes.—N.B. Those peculiar to the Indo-Malayan subregion are marked with an asterisk.

1. *Poliornis.*
2. *Spilornis.*
3. *Polioaëtus.*
4. *Limnaëtus.*
5. *Neopus.*
6. *Lophospiza.*
7. *Hierax.*
8. *Ephialtes.*
9. *Loriculus.*
10. *Yungipicus.*
11. *Mulleripicus.*
12. *Phœnicophæus.*
*13. *Centrococcyx.*
14. *Craniorrhinus.*
15. *Lyncornis.*
16. *Pelargopsis.*
17. *Callialcyon.*
18. *Geocichla.*
19. *Broderipus.*
20. *Trichostoma.*
21. *Cyornis.*
22. *Myiolestes.*
23. *Hypothymis.*
24. *Æthopyga.*
25. *Nectarophila.*
*26. *Anthreptes.*
27. *Arachnechthra.*
28. *Dicæum.*
29. *Arachnothera.*
*30. *Prionochilus.*
31. *Munia.*
*32. *Padda.*
33. *Acridotheres.*
34. *Sturnia.*
35. *Osmotreron.*
36. *Gallus.*
37. *Erythra.*
38. *Rallina.*

“The next table consists of the twenty-three Australian genera which are also Celebean. Two of these appear to be peculiar to the Australian subregion‡; of the remainder some are Papuan, and some extend into the Polynesian subregion.

“TABLE II.—Showing the Australian genera found in Celebes.—N.B. Those belonging especially to the Australian subregion are marked with a dagger (†); to the Papuan§ with an asterisk (*).

*1. *Teraspiza.*
*2. *Erythrospiza.*
3. *Cacatua.*
*4. *Tanygnathus.*
5. *Trichoglossus.*
6. *Sauropatis.*
7. *Collocalia.*
†8. *Scythrops.*
*9. *Dicrurus.*
10. *Artamus.*
11. *Graucalus.*
12. *Lalage.*
*13. *Chalcostetha.*
*14. *Zonœnas.*
*15. *Turacœna.*
*16. *Calœnas.*
17. *Phlegœnas.*
*18. *Myristicivora.*
*19. *Lamprotreron.*
*20. *Iotreron.*
*21. *Leucotreron.*
22. *Megapodius.*
†23. *Hydralector.*

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‡ *Conf.* Sclater, P. Z. S. 1869, p. 125.

§ The Papuan *Dicruri* are generically separable.

"Eighteen Celebean genera may be considered common to the Indian and Australian regions, the proportion of species in each region being about equal. Some occur outside the limits.

"TABLE III.—Showing the genera found in Celebes which are also common to the Indian and Australian regions.—N.B. Genera which do not occur in the Polynesian subregion are marked with an asterisk.

*_Tachyspiza._
*_Haliastur._
*_Cuncuma._
*_Baza._
*_Eudynamis._
Cacomantis.
*_Macropteryx._
*_Hirundinapus._
*_Pitta._
*_Volvocivora._
*_Calornis._
*_Ducula._
*_Macropygia._
*_Chalcophaps._
*_Geopelia._
*_Muscadivora._
*_Excalfactoria._
*_Esacus._

"Fifty-eight are genera which are found within the limits of the Indian region and also beyond. Eight of these belong to the _Rapaces_, six to the _Picariæ_, two to the _Gallinæ_, twenty-five to the _Grallæ_, ten to the _Anseres_, and only seven to the _Passeres_. Nine of these fifty-eight genera are unrepresented in the Australian subregion.

"TABLE IV.—Showing the genera represented in Celebes which likewise occur both within and beyond the limits of the Indian region.—N.B. Genera not occurring in the Australian subregion are marked with an asterisk.

Tinnunculus.
*_Hypotriorchis._
*_Pernis._
Milvus.
Elanus.
Circus.
Athene.
Strix.
Hirundo.
Merops.
*_Coracias._
Eurystomus.
*_Alcedo._
*_Buceros._
Acrocephalus.
Cisticola.
*_Budytes._
*_Pratincola._
*_Monticola._
Zosterops.
Corvus.
*_Turtur._
Turnix.
Eudromias.
Ægialites.
Charadrius.
Strepsilas.
Himantopus.
Porphyrio.
Hypotænidia.
Rallina.
Gallinula.
Numenius.
Actitis.
Lobipes.
Totanus.
Limosa.
Tringa.
Gallinago.
Melanopelargus.
Falcinellus.
Ardea.
Herodias.
Ardetta.
Demiegretta.
Ardeola.
Nycticorax.
Butorides.
*_Querquedula._
Mareca.
Dendrocygna.
Hydrochelidon.
Onychoprion.
Pelecanopus.
Plotus.
Phalacrocorax.
Dysporus.
Podiceps.

"The following nine genera are peculiar to the island of Celebes:—

Meropogon.
Monachalcyon.
Ceycopsis.
Artamides.
Gazzola.
Strepticitta.
Enodes.
Scissirostrum.
Megacephalon.

One genus is restricted to Celebes and the Sanghir islands,

Cittura;

one to Celebes and the Philippines,

Prioniturus;

and one to Celebes and Ceram,

Basilornis.

"Of these twelve genera, *Meropogon*, *Strepticitta*, and *Basilornis* belong to the non-Australian families; *Gazzola* to the almost universal *Corvinæ*; *Monachalcyon*, *Ceycopsis*, and *Cittura* are isolated genera of a family in which the Australian region is pre-eminently rich; *Enodes* and *Scissirostrum* have affinities with genera common to the Indian and Australian regions; *Megacephalon* is strictly Australian. The affinities of *Prioniturus* seem to be with Australian genera.

"The total number of Celebean genera also found within the Indian region, but not in the Australian, is forty-eight*.

"The total number of Celebean genera also occurring in the Australian region, but not in the Indian, is twenty-three. If we compare these numbers, we find that Celebes contains twenty-five more Indian than Australian genera.

"If we make the same comparison by orders, the following results are obtained:—

	Indian region.	Australian region.
Psittaci	1	3
Rapaces	10	2
Picariæ	11	3
Passeres	20	5
Columbæ	2	8
Gallinæ	1	1
Grallæ	2	1
Anseres	1	0
Total	48	23

"So while the Celebean *Rapaces* and *Passeres* contain a large majority of Indian genera, in the *Psittaci* and *Columbæ* Australian genera preponderate. *Loriculus* is classed as an Indian genus; yet until the zoogeographical positions of the Philippines and of Celebes are determined the zoogeographical characters of *Loriculus* cannot be established. Within the limits of the Philippine and Celebean areas, seven out of the thirteen known species occur. Another, *L. amabilis*, a representative form of the Celebean *L. stigmatus*, occurs in the Sanghir Islands, and is also Papuan, being found at Gilolo and Batchian. The remaining five, one of which (*L. flosculus*) is the Flores representative of the Javan *L. pusillus*, are peculiar to the Indian region. If, then, we cease to regard *Loriculus* as having an Indian origin, all the five genera of *Psittaci* known in Celebes are either Australian or peculiar. The *Columbæ* while imparting a decided, it may even be affirmed an absolute, Australian character to the Celebean avifauna, as clearly indicate a very close Philippine affinity.

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* It is true that *Buceros*, *Alcedo*, *Budytes*, and *Pratincola* occur in some of the Papuan and Moluccan islands; but they cannot be considered as genera belonging to the Australian region.

"Among the *Gallinæ*, *Gallus* and *Megapodius* are severally representatives of equally important typical families, characterizing one the Indian, the other the Australian region. But Celebes and the Philippines[*] are the only areas where representatives of the *Phasianidæ* and *Megapodidæ* are associated.

"Among the *Picariæ*, the presence of *Scythrops* can hardly be deemed sufficient to balance the two genera of *Picidæ*, more especially if *Scythrops* be migratory in Celebes, as in Australia. But though three of the genera belonging to the *Alcedinidæ* are Indian, yet the great richness of the family in Celebes forms an important element in favour of the Australian nature of the Celebean ornis.

"But to obtain a still more complete conception of the zoogeographical characters of Celebean ornithology, the following tables have been prepared, showing the principal Indian and Australian genera that do not occur in the island.

"Notwithstanding the great preponderance of Indian genera, some entire families, and a large number of genera characteristic of, if not altogether peculiar to, the Indian regions are wanting in Celebes. For instance, the following important families are without representation:—

Sittidæ.
Trogonidæ.
Megalaimidæ.
Paridæ.
Brachypodidæ.
Pycnonotidæ.
Laniidæ.
Alaudidæ.

"And the great families of the *Picidæ* and *Timaliidæ* are but poorly indicated—the first by two genera, the last by but a single genus. Among the *Grallæ* and *Anseres*, the *Otididæ*, *Cursoridæ*, *Glareolidæ* and *Gruidæ*, and the *Phœnicopteridæ*, all families having representation in the Indian region, appear to be unknown in Celebes. The absence of the *Vulturidæ* is a feature in common with the whole Indo-Malayan region. The number of *Anatidæ* and *Laridæ* recorded from Celebes is so small that it seems probable that members of those families have been overlooked by collectors.

"After excluding from the list of genera found in the Indian region all those that do not likewise form an Indo-Malayan habitat, at least eighty-eight Indian genera are absent from Celebes; of these twelve are purely Indo-Malayan.

"TABLE V.—Showing the principal Indian genera which are wanting in Celebes.—N.B. Purely Indo-Malayan genera are marked with a dagger.

Ierax.
Ketupa.
Bulaca.
Phodilus.
Batrachostomus.
†*Eurylaimus.*

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[*] It is as yet uncertain whether the Philippine *Gallus* inhabits the same islands as the Philippine *Megapodii*. *Gallus* is only known for certain to occur in Luzon.

Psarisomus.
†*Corydon.*
†*Cymbirhynchus.*
†*Calyptomena.*
Harpactes.
Ceyx.
Nyctiornis.
Chalcococcyx.
Dendrophila.
Chalcoparia.
Orthotomus.
Prinia.
Enicurus.
Corydalla.
Copsychus.
Cittocincla.
Phyllornis.
Iora.
Hypsipetes.
Ixos.
Brachypodius.
Pycnonotus.
Iole.
Criniger.
Irena.
Analcipus.
Brachypteryx.
Myiophonus.
Mixornis.
Malacopteron.
†*Macronyx.*
Alcippe.
Timalia.
Megalurus.
Garrulax.
Pomatorhinus.
Pteruthrius.
Parus.
†*Platylophus.*
Lanius.
Tephrodornis.
Buchanga.
Dissemurus.
Chaptia.
Bhringa.
Pericrocotus.
Hemipus.
Eumyias.
†*Philentoma.*
Tchitrea.
Leucocirca.
Cissa.
†*Temnurus.*
Dendrocitta.
Crypsirhina.
Eulabes.
Ploceus.
Passer.
Mirafra.
Palæornis.
Megalaima.
Xantholæma.
Meiglyptes.
Hemicircus.
Micropternus.
Chrysocolaptes.
Chrysophlegma.
Tiga.
Sasia.
Rhopodytes.
Coccystes.
†*Peloperdix.*
Arborophila.
Perdicula.
Pavo.
†*Argusianus.*
Polyplectron.
Euplocamus.
†*Rollulus.*
Metopidius.
Gallicrex.
Hydrophasianus.

"The islands to the eastward of Celebes (the Papuan or Austro-Malayan region of Mr. Wallace) are characterized by a large number of peculiar genera. Of these at least forty-four are absent from Celebes. Besides the families of the *Epimachidæ* and the *Paradiseidæ*, important groups, such as *Podargus*, *Pachycephala*, and *Manucodia*, are all wanting. Nor does a single Papuan Muscicapine form occur in Celebes. Papuan genera belonging to the two great orders *Psittaci* and *Columbæ*, orders which are so largely developed in the Australian region, and in no part of that region to a greater extent than in its Papuan subregion, are found in Celebes. This fact is justly regarded as sufficient to stamp the ornis of that island with a Papuan character. Yet among the *Psittacidæ* such essentially typical Australian genera (also Papuan) as *Lorius* and *Platycercus* do not extend to Celebes. And several peculiar Papuan types are there unknown. The Columbæ of the Papuan subregion are well represented in Celebes; yet, with one exception (*Phlegœnas*), all the Papuan genera of the *Gouridæ* are missing*.

"By the annexed table it will also be seen that several remarkable Papuan forms belonging to another characteristic Papuan family (*Alcedinidæ*) are not found in Celebes.

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* *Calœnas* is a migratory form.

"TABLE VI.—Showing the principal Austro-Malayan or Papuan genera which do not occur in Celebes.

Henicopernis.
Podargus.
Ægotheles.
Eurystopodus.
Choucalcyon.
Mellidora.
Cyanalcyon.
Syma.
Alcyone.
Myzomela.
Entomophila.
Glyciphila.
Meliphaga.
Anthochæra.
Philemon.
Gerygone.
Petroica.
Peltops.
Machærirhynchus.
Arses.
Monarcha.
Piezorhynchus.
Micrœca.
Todopsis.
Mimeta.
Rectes.
Cracticus.
Pachycephala.
Myiolestes.
Manucodia.
Ptilonorhynchus.
Lycocorax.
Gymnocorvus.
Eos.
Lorius.
Geoffroyius.
Charmosyna.
Platycercus.
Psittacula (Cyclopsitta).
Nasiterna.
Microglossum.
Dasyptilus.
Trogon.
Goura.
Henicophaps.
Casuarius.

"The zoogeographical relationship of the Philippines and Celebes, as exemplified by their birds, has been adverted to by Mr. Wallace and other writers. Unfortunately the Philippine archipelago, with its twelve hundred islands, has been but imperfectly explored; while the localities of many, if not of all the known Philippine species are but vaguely ascertained. Luzon, the island whose ornithology has been the most investigated, is the furthest off from Celebes, and has the large island of Mindanao and many of less importance intervening. The resemblance which exists between the Celebean and Philippine avifaunas rests on the occurrence of Papuan genera in Mindanao, and perhaps in South Luzon, which likewise occur in Celebes: *Cacatua, Cyclopsitta, Tanygnathus, Phlegœnas**, *Hemiphaga*, and *Megapodius* may be cited. Two genera seem to be confined to Celebes and the Philippines—*Prioniturus* and *Pyrrhocentor*; this last is only known from Mindanao. *Megapodius cumingi* (Gould) is stated by Camel (v. Martens, *op. cit.*) to be found at Tabon in Mindanao and in Mindoro. The exact habitats of the other genera remain to be determined. The known Philippine genera of the *Picariæ* and *Passeres* are nearly all Indo-Malayan; but then they have mostly been as yet only obtained from the neighbourhood of Manilla. They include characteristic Indian genera unknown in Celebes. Such are, besides *Hierax, Harpactes, Chrysocolaptes*, and several other *Picidæ, Xantholæma, Irena, Copsychus, Cittacincla, Tchitrea, Ixos, Hypsipetes, Parus*, and genera such as *Lanius* and *Turdus*.

"That Mindanao contains a strong Indian element, however, is shown by the fact that *Xantholæma, Irena*, and *Copsychus* have been there obtained; *Irena* also occurs in the island of Panay. Thus enough is known of the Philippine ornis to justify anticipation, when worked out, of highly interesting zoogeographical facts, but not sufficient to enable us to determine the degree of relationship between the avifauna of the Philippine and Celebean areas.

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* *Phlegœnas luzonica* (Scop.), = *cruenta* (Gm.), is said by Bureta to occur in the Calamines (*conf.* v. Martens, J. für O. 1866, p. 25).

"The absence of the two genera *Criniger* and *Rhipidura* in Celebes constitutes one of the many peculiarities of its ornis. *Criniger*, represented in the neighbouring Sula Islands by a peculiar species, possesses other representatives in many of the Moluccan islands and throughout the Indo-Malayan subregion.

"*Rhipidura* is still more widely and largely represented in the whole Australian region, and in the Indo-Malayan subregion, having representatives in all the islands of the Malay archipelago, excepting Celebes and the Sula Islands.

"Then, again, the presence of the two genera *Coracias* and *Myialestes* is equally remarkable; for they are both unknown in any part of the Indo-Malayan region, and only reappear on the mainland of Asia.

"After rejecting all those species whose Celebean origin does not rest upon the most undoubted authority, I find that the number of birds inhabiting Celebes amounts to, at least, one hundred and ninety-three. Of this number sixty-five are peculiar to the island. Twenty more are found also in the Sula Islands, or the Sanghir group, making a total of eighty-five species peculiar to Celebes and the two gronps just mentioned. Of the remaining one hundred and eight species, fifty-five have Indian affinities (that is, are elsewhere only found in the Indian region as opposed to the Australian), though many extend beyond the limits of the Indian region; fourteen are found in the Australian and not in the Indian region, and twenty-eight are common to both regions; eight more species seem to be confined to the Moluccan islands; and three, not included above, are doubtfully found beyond Celebes: these are *Elanus hypoleucos*, *Ephialtes menadensis*, and the Celebean form of *Iotreron melanocephala*."

This paper will be published entire in the Society's 'Transactions.'

The following papers were read:—

1. A Revised Catalogue of the Birds of China and its Islands, with Descriptions of New Species, References to former Notes, and occasional Remarks. By ROBERT SWINHOE, F.Z.S.

[Received March 15, 1871.]

1. GYPAËTUS BARBATUS, Cuv.; Ibis, 1867, p. 413; P. Z. S. 1870, p. 430.

I have seen, in the museum attached to the Catholic Mission at Pekin, a Bearded Vulture, procured by Père Armand David in the mountains west of that city. There is also a specimen of it in the British Museum, marked "China."

2. VULTUR MONACHUS, L.; Ibis, 1867, p. 413.

There are specimens of this Vulture in the Peking Museum, procured by Père David from the mountains in the north-west of the Chelee Province.

3. AQUILA CHRYSAËTOS, Cuv.; P. Z. S. 1870, p. 443.

Eagles were several times seen by myself in the Nankow Pass, on the road from Peking to Mongolia, but I was not able to determine the species. Père David identifies the resident species of these mountains with the Golden Eagle, and mentions meeting with a large variety, with longer bill and white tarse ("Catalogue des oiseaux à Pékin," Nouv. Arch. du Muséum d'Hist. Nat. de Paris, tome iii. 1867), which Mr. Gurney tells me he has seen from Denmark and also from Algeria. Mr. Gurney adds that "the specimens were in other respects in the usual plumage of the *second year*. The Danish examples were certainly large and fine, the Algerian not particularly so. At present I have seen no sufficient difference to make me think that there are two species or races of Golden Eagle."

4. AQUILA BIFASCIATA, J. E. Gray.

Aquila heliaca, P. Z. S. 1863, p. 259; Ibis, 1865, p. 347.

Mr. Howard Saunders has demonstrated to this Society* that the eastern form of Imperial Eagle differs, in its first plumage at least, from the European bird, and is apparently a distinct species. M. Milne-Edwards refers to Dr. Gray's name a bird sent from Pekin by Père David, on which the Abbé remarks, "common on our mountains and in Mongolia." This species has been shot in the immature plumage in winter at Foochow; and I have noticed it in adult plumage with white scapulars on Ape's Hill, Takow, S.W. Formosa.

5. AQUILA AMURENSIS, sp. nov.

Similis A. clangæ, *Pall., sed major.*

M. Milne-Edwards identifies the Tawny Eagle from Peking with *A. clanga* of Pallas; and Pére David notes the occurrence also at the same locality of the smaller allied form, *A. nævia*, Briss. A specimen from the Amoor, kindly sent me by Dr. v. Schrenck, is of large size, and, in Mr. Gurney's opinion, worthy of separation as a third species of this group. I enter this in the present list under the supposition that it will be the same as No. 5 of Père David's catalogue, which he also states to be "common in our mountains and in Mongolia." Mr. Gurney very obligingly compared the Amoor specimen with a female of *Aquila clanga* from Sarepta, on the Volga, and has given me the following measurements:—

	Entire length.	Wing from carpel joint.	Tail.	Tarsus.	Middle toe without claw.
A. clanga ♀ (ad.)...	31 in.	23 in.	11 in.	3½ in.	2¼ in.
A. amurensis ♀ (ad.)	33½ ,,	26¼ ,,	12½ ,,	4½ ,,	2¼ ,,

Mr. Gurney writes:—"In plumage, I do not find that it differs from the adult of *A. clanga*, except in having the pale transverse bars on the secondaries lighter in their hue, and therefore more conspicuous, especially on the outer webs.

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* See *anteà*, p. 37.

"It would seem that there are three races of Eagles, only differing in comparative size:—

"*Aquila nævia*. The smallest of the three, found in Egypt, Southern Europe, Smyrna, Palestine, India, and Sumatra (one specimen).

"*Aquila clanga*, Pall. The intermediate race, found at Sarepta, near the mouth of the Volga. Both it and the preceding have been obtained in European Turkey and in Palestine. I have also seen the Sarepta race from Mesopotamia; but how far it extends eastward I do not know.

"*Aquila* (from Amoorland). The largest race. How far it extends westward I do not know."

6. HALIAËTUS ALBICILLA (L.); Ibis, 1865, p. 347; P. Z. S. 1863, p. 259.

From the river Yangtsze northwards. Seen only occasionally in the south. An immature bird flew on board a ship in the harbour of Swatow, and allowed itself to be captured, in the winter of 1867–68. It fell into my hands. Its iris was clear yellowish brown; cere light bluish grey; feet lemon-yellow, with black claws.

7. HALIAËTUS PELAGICUS, Pall.; P. Z. S. 1863, p. 260.

Père David saw this giant Eagle once at Peking, and says that it is well known to the Chinese.

8. ARCHIBUTEO AQUILINUS, Hodgs.

Butaquila aquilina et *B. leucocephala*, Hodgs.
Butaquila hemilasius, Schleg. Faun. Jap.
Buteo lagopus, David, Catalogue des oiseaux à Pékin.
Falco hemilasius, Temm. et Schleg. Faun. Jap.

In January 1868 a large male Buzzard was shot by Consul Caine at Swatow. Mr. Gurney has determined it to be of this species. Its cere was greenish yellow; iris straw-yellow, redder round the pupil; legs dingy orange-tinted yellow, with black claws. It is not in mature plumage. Père David has sent specimens of the same to the Paris Museum, and writes that it is not rare at Pekin and breeds there.

9. BUTEO ASIATICUS (Lath.).

Buteo japonicus, Temm. et Schleg. Faun. Japon.; Zoologist, 1858, p. 6227; Ibis, 1860, p. 46, 1861, pp. 24, 326, 1863, pp. 210, 1870, p. 87; P. Z. S. 1863, p. 260.

South China to Hainan, and Formosa in winter.

10. SPIZAËTUS NIPALENSIS, Hodgs.

Spizaëtus orientalis, Temm. et Schleg. Faun. Japon.; Swinhoe, Ibis, 1863, p. 211.

Formosa.

11. **Spilornis cheela** (Daud.).

Spilornis hoya, Swinhoe, Ibis, 1866, pp. 304, 307, 399, 1867, pp. 409, 410.

Formosa; Amoy (China).

12. **Spilornis rutherfordi**, Swinhoe, Ibis, 1870, p. 85.

Hainan.

13. **Poliornis poliogenys** (Temm. et Schleg.); Swinhoe, Ibis, 1863, p. 88, 1864, p. 429, 1865, p. 545, 1866, p. 136, 1867, p. 411; P. Z. S. 1862, p. 315, 1863, p. 260, 1870, p. 600.

Buteo pygmæus, Blyth, Ibis, 1865, p. 29.

Formosa; coast of China. Goes as far south in winter as the Tenasserim Provinces.

14. **Pandion haliaëtus** (L.): Swinhoe, Zoologist, 1858, p. 6227, 1860, p. 7102, 1861, p. 7642, 1864, p. 9224; Ibis, 1860, p. 46, 1861, p. 24, 1863, p. 209, 1865, p. 347, 1870, p. 86; P. Z. S. 1863, p. 260.

Throughout China, Formosa, and Hainan.

15. **Falco peregrinus**, L.; Zool. 1858, p. 6226; Ibis, 1860, p. 46, 1861, p. 24, 1863, p. 210, 1867, p. 388, 1870, p. 84; P. Z. S. 1863, p. 260.

China, Formosa, and Hainan.

16. **Falco sacer**, Schlegel; P. Z. S. 1863, p. 260.

Buteo ——?, Ibis, 1861, p. 326, 1863, p. 88.

Pekin.

17. **Hypotriorchis subbuteo** (L.); Ibis, 1860, p. 46, 1863, p. 89.

Falco subbuteo, P. Z. S. 1862, p. 315, 1863, p. 260.

Amoy; Pekin.

18. **Hypotriorchis æsalon** (L).

Falco æsalon, Ibis, 1861, p. 327; P. Z. S. 1863, p. 260.

Amoy; Pekin.

19. **Tinnunculus alaudarius, var. japonicus.**

Tinnunculus alaudarius, Swinh. Ibis, 1860, p. 47, 1861, p. 24, 1866, p. 293, 1867, p. 385, 1870, p. 84.

Falco tinnunculus, Ibis, 1861, p. 327.

Tinnunculus japonicus, Ibis, 1863, p. 211, 1864, p. 424; P. Z. S. 1863, p. 261.

China, Formosa, and Hainan.

20. **Erythropus amurensis** (Radde); Gurney, Ibis, 1868, p. 41, pl. 11; P. Z. S. 1870, pp. 436, 448.

Erythropus vespertinus, Ibis, 1861, pp. 253, 327; P. Z. S. 1862, p. 315, 1863, p. 260.

Summers at Pekin, and collects in large numbers in September before going south. Wanders in winter to India and Africa.

21. TICHORNIS PEKINENSIS.

Falco cenchris, var. *pekinensis*, Swinhoe, P. Z. S. 1870, pp. 442, 448.

Breeds on the western hills of Pekin, and assembles in large numbers in September. Mr. Hodgson's drawing of the Nepal bird (in the British Museum) shows that it is this race of *Tichornis cenchris* that resorts to India.

The adult male has all the wing-coverts grey right up to the scapulars; the inner or short primaries are broadly bordered at their tips with whitish, rufous in the immature; the white on the under quills is 3¼ inches short of their tips.

22. PERNIS APIVORUS (L.); David, Catalogue des oiseaux à Pékin.

Père David notes this as found about Pekin in autumn. Schlegel has it from Japan (Musée des Pays-Bas, *Pernes*, p. 2).

23. MILVUS GOVINDA, Sykes; Swinh. Zoolog. 1858, p. 6227; Ibis, 1860, p. 47, 1861, pp. 25, 253, 326, 1863, p. 210, 1865, p. 546, 1866, p. 121, 1867, p. 236, 1870, p. 88.

Milvus melanotis, Ibis, 1865, p. 348, 1867, pp. 409, 411; P. Z. S. 1863, p. 260.

China, Formosa, and Hainan.

24. MILVUS MIGRANS (Bodd.).

Milvus ater, Gm.

A live specimen of this Kite, said to have been brought from North China, is now living in the Society's gardens.

25. ASTUR PALUMBARIUS (L.); P. Z. S. 1863, p. 261, 1870, p. 448.

I have an adult male from Pekin, which does not differ from home-shot specimens.

26. LOPHOSPIZA TRIVIRGATA (Cuv.); Temm. Pl. Col. 303; Ibis, 1865, p. 547, 1866, p. 395.

Formosa. The Malay form.

27. ACCIPITER NISUS (L.); Zoolog. 1858, p. 6227; Ibis, 1861, p. 327, 1870, p. 84; P. Z. S. 1863, p. 261, 1870, p. 443.

Accipiter ——? Ibis, 1860, pp. 47, 429, 1863, p. 88.

Peking, Amoy, and Canton.

28. ACCIPITER STEVENSONI, Gurney; Ibis, 1863, p. 447, pl. 11; P. Z. S. 1863, p. 261, 1870, p. 600.

Micronisus, sp.?, Ibis, 1861, p. 25.

Accipiter gularis?, Ibis, 1863, p. 89.

Canton to Pekin.

29. ACCIPITER GULARIS, Schleg. F. J. t. 2; Gurney, Ibis, 1865, pp. 236, 547; P. Z. S. 1863, p. 261.

Accipiter nisoides, Blyth, Ibis, 1865, p. 28.

Formosa.

30. ACCIPITER VIRGATUS, Temm. Pl. Col. 109; Ibis, 1865, p. 108, 1866, p. 405.

Micronisus gularis, Ibis, 1863, p. 212.
Formosa.

31. MICRONISUS BADIUS (Gm.); Swinh. Ibis, 1870, p. 84.

Hainan.

32. MICRONISUS SOLOËNSIS (Horsf.); Pl. Col. 110, 129; Ibis, 1863, p. 89, 1866, p. 403; P. Z. S. 1862, p. 315, 1863, p. 261.

Micronisus badius, Ibis, 1860, p. 359.
Accipiter virgatus, Ibis, 1861, p. 264.
Amoy; Pescadores; Shanghai (Brit. Museum); Pekin.

33. CIRCUS ÆRUGINOSUS, L.; Ibis, 1865, pp. 349, 352, 1870, p. 87.

Swatow; Amoy; S.W. Formosa; Hainan.

34. CIRCUS SPILONOTUS, Kaup; Ibis, 1863, p. 213, pl. 5, 1865, pp. 230, 347, 1870, p. 87; P. Z. S. 1863, p. 261.

Circus æruginosus, Ibis, 1860, pp. 47, 359.
Amoy; river Yangtsze; Formosa.

35. CIRCUS CYANEUS, L.; Zoolog. 1858, p. 6227; Ibis, 1860, p. 47, 1861, p. 326, 1870, p. 88; P. Z. S. 1863, p. 261.

Amoy.

36. CIRCUS MELANOLEUCUS, Gm.; P. Z. S. 1862, p. 315, 1863, p. 261.

Circus —— ?, Ibis, 1861, p. 326, 1863, p. 88.
Tientsin.

37. CIRCUS CINERACEUS, Montagu.

River Yangtsze.

38. CIRCUS PALLIDUS, Sykes.

Circus swainsonii, A. Smith; P. Z. S. 1863, p. 261.
River Yangtsze.

39. ATHENE PLUMIPES, Swinhoe, P. Z. S. 1870, p. 448.

Similis A. glauci, *sed pedibus dense plumatis.*

Not common about the Pekin neighbourhood in autumn; is found also in the Lake-Baikal region, according to Tacsanowsky of Warsaw.

40. ATHENE WHITELYI, Blyth, Ibis, 1867, p. 313.

Athene cuculoides, Ibis, 1861, pp. 25, 265, 1867, p. 406; P. Z. S. 1863, p. 262.

Ab A. cuculoidi *alarum et caudæ fasciis paucioribus distinguenda.*

Amoy; Canton; Foochow; Szechuen. Goes south on the approach of winter.

41. ATHENE BRODIÆI (Burt.).

Noctua brodiæi, Burt. P. Z. S. 1835.

Tingchow (Fokien Province). One specimen of this was brought to me at Amoy in January 1867.

42. ATHENE PARDALOTA, Swinhoe; Ibis, 1863, p. 216.

Differt a sp. præcedente ventre medio nigro guttato.

Formosa.

43. NINOX JAPONICA, Temm. et Schleg.; Zool. 1858, p. 6228; Ibis, 1863, pp. 89, 215, 1864, p. 427, 1866, p. 307, 1870, p. 88; P. Z. S. 1862, p. 316, 1863, p. 262.

Athene scutellata (Raffles); Ibis, 1860, p. 47.

Amoy; Hainan; Formosa; Tientsin.

44. BUBO MAXIMUS, Sibb.; Zool. 1858, p. 6227; Ibis, 1860, p. 47, 1861, pp. 254, 327; P. Z. S. 1863, p. 262.

Amoy, North China.

45. KETUPA CEYLONENSIS (Gmel.); Ibis, 1861, p. 27; P. Z. S. 1863, p. 262.

Hongkong.

46. SCOPS SUNIA, Hodgs.

Scops japonicus, Schleg. Faun. Japon.; Zool. 1858, p. 6228; Ibis, 1863, p. 89; P. Z. S. 1863, p. 262.

Scops bakkamœna (Penn.); Ibis, 1860, p. 47; P. Z. S. 1862, p. 316.

Amoy in winter; Pekin.

47. LEMPIJIUS SEMITORQUES (Schleg.).

Ephialtes plumipes, Hume, Scrap Book, Part 1, No. 2, p. 307.

Digitis supra plumatis.

Schlegel (Mus. des Pays-Bas, *Oti*, p. 24) cites specimens from Japan and Nepal. Père David has sent it from Moupin (N.W. corner of Szechuen).

48. LEMPIJIUS GLABRIPES.

Ephialtes glabripes, Swinh. Ann. & Mag. Nat. Hist. vol. vi. 4th series, p. 152.

Scops semitorques, Swinh. (*nec* Schlegel), Ibis, 1863, p. 217, 1867, p. 409; P. Z. S. 1863, p. 262.

Scops ——?, Ibis, 1861, p. 29.
Scops lempiji, Ibis, 1861, p. 265.
Digitis nudis.

Amoy; Foochow; Canton; Formosa. Differs from the foregoing in having the toes always bare instead of feathered along their upper surfaces.

49. LEMPIJIUS UMBRATILIS, Swinh. Ibis, 1870, p. 342.

Ephialtes lettia, Ibis, 1870, p. 88.
Hainan.

50. LEMPIJIUS HAMBROECKI.

Ephialtes hambroecki, Swinh. Ann. & Mag. Nat. Hist. vol. vi. 4th series, p. 153.
Scops japonicus, Ibis, 1865, p. 348, 1866, p. 307.

Formosa. Of the *Lempiji* form and type, but small and rufous, and at first sight to be mistaken for *Scops japonicus.*

51. SYRNIUM NIVICOLUM, Hodgs. J. A. S. xiv. p. 185; P. Z. S. 1870, pp. 438, 443.

Pekin in autumn.

52. PTYNX FULVESCENS (Temm. et Schleg.).

Sent to the Paris Museum by Père David from the Moupin Mountains (N.W. Szechuen).

53. BULACA NEWARENSIS (Hodgs.).

Bubo caligatus, Swinh. Ibis, 1863, p. 218, 1864, p. 429.
Formosa.

54. OTUS VULGARIS, Flem.; Ibis, 1863, p. 89; P. Z. S. 1862, p. 316, 1863, p. 262.

Tientsin.

55. OTUS BRACHYOTUS (L.); Ibis, 1861, pp. 26, 327, 1863, p. 89; P. Z. S. 1863, p. 262.

Peking; Canton.

56. STRIX CANDIDA, Tickell.

Strix pithecops, Swinhoe, Ibis, 1866, pp. 396, 397.
S.W. Formosa.

57. CAPRIMULGUS JOTAKA, Temm. et Schleg. F. J.; Ibis, 1861, p. 327, 1870, p. 89; P. Z. S. 1863, p. 263, 1870, p. 439.

Caprimulgus ——?, Ibis, 1860, p. 47, 1861, p. 30.
Caprimulgus dytiscivorus, Swinh. Ibis, 1860, p. 130.
Caprimulgus swinhoei, Blyth; Ibis, 1861, p. 263.
China.

58. CAPRIMULGUS MONTICOLA, Frankl. P. Z. S. 1831, p. 116.

Caprimulgus stictomus, Swinh. P. Z. S. 1863, p. 263.
Caprimulgus pallidus, Gray, Zool. Misc. p. 2.
Caprimulgus ——?, Ibis, 1860, p 47, 1861, p. 30.

South China in summer. I have a very rufous and brightly marked female from Amoy, which I at first confounded with the following bird.

59. CAPRIMULGUS STICTOMUS, Swinhoe, Ibis, 1863, p. 250, 1866, pp. 315, 402.

Like the last, but smaller, with the toes, especially the middle one, conspicuously longer. Resident in Formosa.

60. CYPSELUS PEKINENSIS, Swinhoe, P. Z. S. 1870, p. 435.

This pale representative of *C. apus*, L., comes to Pekin in large numbers in April (*David*) to breed, and leaves early in August. A bird from the Himalayas, brought home by Dr. Jerdon, agrees with my specimens; and it is probably this species, and not the true *C. apus*, which is found in India in winter.

61. CYPSELUS PACIFICUS, Lath. Ind. Orn. Suppl. p. 58; Ibis, 1870, p. 89.

Cypselus vittatus, Jard. Ill. Orn. ser. 2. pl. 39; Ibis, 1860, pp. 48, 429, 1861, pp. 254, 328, 1863, p. 253, 1865, p. 356; P. Z. S. 1863, p. 263.
Hainan to Pekin, and in Formosa.

62. CYPSELUS SUBFURCATUS, Blyth; Ibis, 1863, p. 254, 1865, p. 355, 1866, p. 131, 1867, p. 227, 1870, p. 89; P. Z. S. 1863, p. 264.

Cypselus affinis, Ibis, 1860, p. 48, 1861, p. 30.
Hainan to Amoy, and in Formosa.

63. CYPSELUS INFUMATUS, Sclater, P. Z. S. 1865, p. 602.

Cypselus tinus, Swinh. Ibis, 1870, p. 90.
Cypselus tectorum, Jerdon.

Hainan. I have compared my specimens with Dr. Jerdon's type from Upper Assam, and with Dr. Sclater's type from Borneo in Mr. Wallace's collection, and find them all to be of the same species.

64. CHÆTURA CAUDACUTA (Lath.).

Hirundo ciris, Pall. Zoograph. Rosso-Asiat.
Acanthylis caudacuta (Lath.), P. Z. S. 1863, p. 263.
Chætura nudipes, Hodgs.; Ibis, 1860, p. 48.
Amoy. Common on the Pekin mountains (*David*).

65. ? CHÆTURA GIGANTEA, V. Hass.; Pl. Col. 364.

Acanthylis caudacuta, Ibis, 1870, p. 90.

It is probably this species that makes the edible nests in the caves of the islands off the south of Hainan, and not the preceding species, as I had at first supposed.

66. Hirundo gutturalis, Scop.; Ibis, 1860, pp. 48, 429, 1861, p. 30, 1863, p. 255, 1870, p. 240; P. Z. S. 1863, p. 287.

Hirundo rustica, Ibis, 1861, p. 254, 328, 1863, p. 89, 1867, p. 411.

Hirundo panayana, Gmel. Syst. Nat. 1788, i. p. 1018.

Throughout China and Formosa in summer. Like *H. rustica*, but much smaller and with broader bill.

67. Cecropis striolata (Temm. & Schleg.).

Hirundo daurica, Ibis, 1860, p. 48, 1863, p. 255.

The striped-belly Swallows that abound in summer in Formosa and breed there belong to the species of this group found in the islands of the Indian archipelago. My specimens agree with one collected by Mr. Wallace at Flores. Seven specimens of this form show no signs of a white spot on the inner web of the outer rectrix.

68. Cecropis japonica (Temm. & Schleg.).

Hirundo daurica, Ibis, 1860, p. 48; P. Z. S. 1863, p. 187.

I believe my Amoy specimens to belong to this species, though I have not been able to compare them with skins from Japan. *Hirundo erythropygia*, Sykes, of India (Gould, B. of As. pl.) is easily distinguished from this by its *deep* rufous *unstreaked* rump, and by the faint narrow streaks of its underparts. An occasional specimen of our bird shows a faint white spot on the inner web of the outer rectrix.

69. Cecropis arctivitta, n. sp.

Hirundo daurica, Ibis, 1861, p. 328, 1863, p. 89; P. Z. S. 1863, p. 287.

The striped Swallow that comes to Pekin to breed is of about the size of the Amoy species, but more faintly and narrowly striped on the underparts, and is easily distinguishable from that and all other species of this group that I have seen by the extreme narrowness of the rufous band across its rump. (Depth of band in *C. japonica* 1·2, in this bird ·7). I was formerly under the impression that the Pekin bird was the true *H. daurica*, L. (*H. alpestris*, Pall.); but I have now no doubt that both Linnæus and Pallas applied their names to *H. rufula*, Temm. (Gould, B. of As. pl.). The Himalayan species, *H. nipalensis*, Hodgs. (*H. daurica*, Gould, B. of As. pl.), has the rump-band nearly as narrow as in ours, but its broad rufous nuchal collar prevents its being confounded with ours. The white spot on the external rectrix is also occasionally seen in the Pekin birds.

70. Cotyle riparia (L.); Ibis, 1861, p. 328, 1863, p. 89; P. Z. S. 1863, p. 287.

Pekin in summer.

71. Cotyle sinensis (J. E. Gray); Swinh. Ibis, 1863, p. 257, 1866, p. 134; P. Z. S. 1863, p. 288.

South China and Formosa.

72. Ptyonoprogne rupestris.

Cotyle rupestris (Scop.); P. Z. S. 1870, p. 445.

Common in the mountains about Pekin. Père David says that in winter many are found together in caverns in a torpid state, and that these on mild days recover from their sleep and fly about over the rocks in the open.

73. Chelidon lagopoda (Pall.); Ibis, 1863, p. 91; P. Z. S. 1863, p. 287.

Chelidon whiteleyi, Swinh. P. Z. S. 1862, p. 320.

Seen in summer about the hills of Pekin and of Ichang, up the Yangtsze. Very scarce. Père David found it nesting in the rocks of San Yu. It avoids the neighbourhood of houses.

74. Eurystomus orientalis (L.); Ibis, 1860, p. 48, 1861, p. 31, 1866, p. 129; P. Z. S. 1863, p. 269.

Canton; Foochow. A summer visitant. Does not quite agree with specimens from India, nor yet with those from Java and Lombock.

75. Halcyon smyrnensis (L.); Gould, B. of As. pl.; Ibis, 1860, p. 48, 1861, p. 31, 1868, p. 59, 1870, p. 93; P. Z. S. 1863, p. 269.

Shanghai to Hainan.

76. Halcyon pileatus, Bodd. Pl. En. 673; Ibis, 1860, p. 49, 1870, p. 93.

Halcyon atricapilla, P. Z. S. 1863, p. 269.
Hainan to Pekin.

77. Halcyon coromandeliana, Scop. Ibis, 1863, p. 259.

Halcyon coromanda, Ibis, 1866, p. 138.
Formosa.

78. Alcedo bengalensis, Gm.; Swinh. Ibis, 1860, p. 49, 1861, pp. 31, 328, 1863, p. 260, 1867, p. 408, 1870, p. 92; P. Z. S. 1863, p. 269.

Hainan to Peking, and in Formosa. The bird in Formosa is usually to be distinguished from the continental race by a blue spot on each side of the breast near the bend of the wing; but this peculiarity occurs also occasionally in birds on the main.

79. Ceryle rudis (L.); Ibis, 1860, p. 49, 1861, p. 31, 1867, p. 408, 1870, p. 92; P. Z. S. 1863, p. 269.

Hainan to Wanchow, and upper waters of the Yangtsze. Chinese specimens rarely have white spots on the black band of the tail.

80. Ceryle lugubris, Temm. Pl. Col. 548.

A bird shot at Ningpo and described to me by a friend answers to this species.

81. Merops daudini, Cuv.; G. R. Gray's Hand-list of Birds.

Merops philippensis, Ibis, 1865, pp. 230, 348, 1870, p. 91.
Merops philippinus, Ibis, 1866, p. 129.

Procured at Swatow. For the edification of our Indian friends it is well to state here that the so-called *M. quinticolor* from India is not the same as the Javan bird. The former differs from the latter in having the under neck blotched with chestnut, and the tail green instead of blue. The Indian species should stand as *M. erythrocephalus*, Brisson, Av. iv. p. 563.

82. Upupa epops, L.; Zool. 1858, p. 6229; Ibis, 1860, p. 49, 1861, pp. 254, 328, 1867, p. 236; P. Z. S. 1863, p. 264.

From Canton to Pekin. I described in the 'Zoologist' for 1858, and in the P. Z. S. for 1863, the peculiar way in which the Hoopoe produces its notes, by puffing out the sides of its neck and hammering on the ground at the production of each note, thereby exhausting the air at the end of the series of three which make up its song. Before it repeats its call it repeats the puffing of the neck, with a slight gurgling noise. When it is able to strike its bill the sound is the correct "hoo-hoo-hoo;" but when perched on a rope and only jerking out the song with nods of the head, the notes more resemble the syllables "hoh-hoh-hoh." Mr. Darwin makes use of this last fact to show that some birds have instrumental means to produce their music (Descent of Man, ii. p. 62). It is not to this point, however, that I wish at present to call attention; but to the fact of the bird's puffing out the sides of its neck. It is generally supposed that the song of a bird is produced by actions of the lower larynx on air passing up the bronchial tubes, onwards and outwards through the main tube or trachea. The trachea of the Hoopoe is not dilatable; but its œsophagus is; and the puffing of its neck is caused by the bulging of its œsophagus with swallowed air. There is no connexion between the œsophagus and the trachea, and apparently no organ at the entrance to the former that could modify sound; what action, then, can this swallowed air be made to take in the production of the bird's notes? Pigeons have strikingly large air-crops, which they empty with each long coo, and refill before they coo again. Many birds swell out the throat when calling or singing, and others move it up and down; these actions must also be caused by the swallowed air in the œsophagus, and must modify the sounds in some way as variously used, adding power and richness in some cases, or giving ventriloquistic effect in others. This question seems never to have been inquired into before; and I throw out the hint in hopes that others may help to elucidate the matter with their investigations. As regards Pigeons, Mr. W. B. Tegetmeier suggests "that the dilated œsophagus and crop serve as a chamber of resonance, the air in which, being thrown into vibration, may be expelled to produce a louder sound."

83. UPUPA CEYLONENSIS, Reichenbach; Blyth, Ibis, 1866, p. 366, 1870, p. 91.

Upupa longirostris, Jerdon, Birds of India, i. p. 393.

Hainan. Also from Java and Ceylon (*Cabanis*); Siam and Burmah. My skins from Hainan agree perfectly with a specimen from Burmah sent me by Mr. Blyth.

84. ÆTHOPYGA CHRISTINÆ, Swinh. Ann. & Mag. Nat. Hist. 4th ser. vol. iv. p. 436; Ibis, 1870, p. 236.

Hainan.

85. ÆTHOPYGA ABRII, J. Verr. Rev. et Mag. de Zool. 1867, p. 173, pl. 15.

Western Szechuen (*David*); Western Yunnan (*Anderson*).

86. ARACHNECHTHRA RHIZOPHORÆ, Swinh. Ann. & Mag. Nat. Hist. 4th ser. vol. iv. p. 436; Ibis, 1870, p. 237.

Hainan. To distinguish this from its ally *A. flammaxillaris*, Blyth, I gave the character of its frontal feathers being iridescent like its throat. M. Jules Verreaux, however, has a specimen from Penang with the forehead showing a few feathers of the same mark. A more constant distinguishing character would appear to be the paleness and dinginess of the yellow of the belly and underparts in our bird as contrasted with the bright yellow of the same in its ally.

87. DICÆUM CRUENTATUM, L.; Ibis, 1867, p. 405, 1868, p. 63, 1870, p. 239.

Fokien; Hongkong; Hainan.

88. DICÆUM MINULLUM, Swinh. Ibis, 1870, p. 240.

Hainan.

89. MYZANTHE IGNIPECTUS, Hodgs.

Tingchow (Fokien Province). I would here note that a specimen of *Piprisoma agile*, Tickell, from India, collected by Mr. Beavan, seems to me undistinguishable from another of *Prionochilus obsoletus* (Müll. & Schleg.) from Flores, collected by Mr. Wallace.

90. ZOSTEROPS SIMPLEX, Swinh. P. Z. S. 1862, p. 317, 1863, pp. 203, 297; Ibis, 1863, p. 294, 1866, p. 121, 1870, p. 348.

Zosterops, sp., Zool. 1858, p. 6229.

Zosterops japonicus, Ibis, 1860, pp. 55 & 131, 1861, p. 35.

Hainan to Wanchow, and in Formosa.

91. Zosterops erythropleura, Swinh. P. Z. S. 1863, pp. 204, 298, 1870, p. 448.

Zosterops japonicus, Ibis, 1861, p. 331; P. Z. S. 1862, p. 317. Shanghai to Pekin.

92. Zosterops subroseus, Swinh. P. Z. S. 1870, p. 132.

Hankow.

93. Sitta villosa, Jules Verreaux, Nouv. Arch. du Muséum, tome i., Bull. p. 78, pl. 4; P. Z. S. 1870, pp. 436, 438.

Sitta pekinensis, David, Cat. des ois. à Pékin; Swinh. P. Z. S. 1870, p. 438.

Pekin. Allied to *S. canadensis*, L., of North America.

94. Sitta amurensis, n. sp.

The Nuthatch from Amoorland, instead of being white-bellied like that from Trans-Baikal and Northern Japan, is rufous underneath, approaching in that respect *S. cæsia* of England and Western Europe. It differs from that species, however, in its shorter bill and tarse, and more slender legs and toes. It has a distinct white eyebrow, its under neck and breast are pure white, and its belly and flanks buff; its under tail-coverts deep cinnamon, spotted with white. It otherwise agrees with *S. cæsia*, and is of about the same size. It ranges down to Pekin in winter.

95. Sitta sinensis, J. Verr. MS.; Ibis, 1865, p. 107.

I observed a small Nuthatch near Ningpo, but did not succeed in securing it. Père David sent to Paris a single specimen of the same from Kinkiang, which will be described by M. J. Verreaux in due course. A larger form of the same type has been sent by Père David from the Moupin Mountains.

96. Certhia familiaris, L.; P. Z. S. 1863, p. 270.

Certhia fasciata, David, Cat. des ois. à Pékin.

A rare visitant to Pekin in winter (*David*). I have a specimen from Pekin from Père David, and another from Amoorland from V. Schrenck, which do not appear separable from the home species.

97. Certhia himalayana, Vig.

Received at the Paris Museum through Père David from the Moupin Mountains (N.W. Szechuen).

98. Tichodroma muraria, L.; P. Z. S. 1863, p. 270.

Foochow; Pekin (*David*).

99. Pnoepyga squamata (Gould).

Sent to the Paris Museum from the Moupin Mountains by Père David.

100. Troglodytes fumigatus, Temm. Man. d'Ornithol. iii. p. 161.

Pekin (*David*).

101. Orthotomus longicauda (Gm.); Swinh. Zool. 1858, p. 6229.

Motacilla longicauda, Gmel. Syst. Nat. 1788, i. p. 954.

Orthotomus phyllorrhapheus, Swinh. Ibis, 1860, p. 49, 1861, p. 32, 1862, p. 258; P. Z. S. 1863, p. 294.

South China. Gmelin's name applies specially to the China bird, so that its Indian ally will have to take the next in priority of its numerous synonyms.

102. Prinia sonitans, Swinh.; Zool. 1858, p. 6229; Ibis, 1860, p. 50, 1861, p. 32, 1863, p. 302, 1870, p. 345; P. Z. S. 1863, p. 294.

South China; Hainan; Formosa.

103. Horeites robustipes, Swinh. Ibis, 1866, p. 398.

Formosa. Like *Horornis assimilis*, Hodgs., from Nepal, but with shorter wings, much shorter tail, and longer and stronger hind claw.

104. Horeites brunneifrons, Hodgs.

Specimens forwarded by Père David from the Moupin Mountains have been thus identified by M. J. Verreaux.

105. Drymœpus extensicauda, Swinh. Ibis, 1860, p. 50, 1861, p. 32, 1863, p. 299, 1865, p. 544, 1870, p. 345; P. Z. S. 1863, p. 294.

Drymœpus flavirostris, Swinh. Ibis, 1863, p. 300 (young bird, individual variety).

Throughout Southern China westwards to Szechuen, in Hainan, and in Formosa. It autumn it acquires a light bill and a very long tail, the whole of its plumage being often suffused with a strong tinge of ochreous. It then much resembles *D. longicauda*, Tickell, of India. In spring the bill turns black, and the long tail is exchanged for a much shorter one, when it approaches the *D. inornata*, Sykes, of India.

106. Suya striata, Swinh. Ibis, 1862, p. 304, 1863, p. 301.

Prinia striata, Swinh. Journ. North China Asiat. Soc. May 1859; Ibis, 1860, pp. 186, 360.

North-west Formosa; Szechuen. Varies much in size.

107. Suya superciliaris, Anderson, P. Z. S. 1871, anteà, p. 212.

Procured by Dr. Anderson at Momien (Yunnan Province).

108. RHOPOPHILUS PEKINENSIS, Swinh. Ibis, 1868, p. 62; P. Z. S. 1870, pp. 436, 443.

Garrulax no. 175, David's Catalogue.

Pekin.

109. CISTICOLA SCHŒNICOLA, Bp.; Ibis, 1863, p. 303, 1870, p. 345; P. Z. S. 1863, p. 295.

Cisticola tintinnabulans, Swinh. Ibis, 1860, pp. 51, 131.

Calamanthella tintinnabulans, Swinh. Journ. North China Asiatic Society, vol. ii. May 1859; Ibis, 1860, pp. 186, 360, 1861, p. 32.

Cisticola cursitans, Ibis, 1861, p. 329.

Throughout China, Hainan, and Formosa.

110. CISTICOLA VOLITANS, Swinh. North China Asiat. Soc. May, 1859; Ibis, 1860, pp. 186, 360, 1863, p. 304.

North Formosa.

111. CISTICOLA MELANOCEPHALA, Anderson, P. Z. S. 1871, p. 212.

Procured by Dr. Anderson at Sonda (Yunnan).

112. CALAMODYTA ORIENTALIS (Temm. et Schleg.).

Calamoherpe orientalis, Swinh. Ibis, 1863, p. 305; P. Z. S. 1863, p. 293, 1870, p. 427.

Acrocephalus magnirostris, Swinhoe, Ibis, 1860, p. 51, 1861, pp, 32, 329.

Canton to Shanghai in summer. Père David notes that it passes Pekin in autumn. Mr. Wallace procured the species in Batchian, Morty, and Lombock.

113. CALAMODYTA FASCIOLATUS (G. R. Gr.).

Acrocephalus fasciolatus, G. R. Gray, P. Z. S. 1860, p. 349.

Calamoherpe subflavescens, Elliot, P. Z. S. 1870, p. 243.

M. J. Verreaux received a specimen of this bird from the Lake-Baikal region; and as it was impossible to suppose that it could be referred to a Moluccan species, and there was nothing else like it, Mr. D. G. Elliot described it as a new species. Lord Walden first pointed out its identity with the Batchian species. In passing to and from its summer quarters it must go through China; and so I introduce it into the China List, though it has not actually been obtained in China.

114. CALAMODYTA INSULARIS.

Acrocephalus insularis, Wallace, Ibis, 1862, p. 350.

Calamoherpe fumigata, Swinhoe, P. Z. S. 1863, pp. 91, 293.

The close affinity of this bird to the last led me to compare it with the second Moluccan species, and I was delighted to find it the same. It comes to Amoy in May in large numbers, and disappears again almost immediately, probably into the interior of China or beyond. Mr. Wallace says he got *C. fasciolatus* in Batchian, Gilolo, and Morty, and *C. insularis* in Gilolo and Morty, that they occurred sparingly, and that it always struck him that they were out of place, for, with the exception of *C. orientalis*, there was nothing like them to the east or west.

115. CALAMODYTA BISTRIGICEPS, Swinh. P. Z. S. 1863, p. 293.

Acrocephalus bistrigiceps, Swinh. Ibis, 1860, p. 51.
Locustella (*à sourcils noirs*), David, Catalogue.
Lusciniopsis, sp., Swinh. Ibis, 1861, p. 412.

Amoy; Pekin. Allied to *C. agricola*, Jerd., of India, but with a black line on each side of its crown.

116. ARUNDINAX AËDON, Pall.

Arundinax olivaceus, Blyth, P. Z. S. 1862, p. 316.
Turdus aëdon, Pall. Zoogr. t. i. p. 459; P. Z. S. 1863, p. 294, 1870, p. 432; Ibis, 1863, p. 91.

Tientsin and Pekin in summer. "Comes to nidificate in our (Pekin) marshes, and leaves again in September" (*David*).

HERBIVOX, n. gen.

Bill moderate, with long lunate aperture to nostril; legs and feet large and strong, with powerful hind toe and claw; wing rounded, with the first four quills graduated, the fourth being the longest; tail moderately graduate. A bush-loving form of *Calamoherpe*. I propose this genus for the three following birds, including *Salicaria cantillans*, T. & S., of Japan, as they have the above characters in common, and do not range happily in any genus hitherto suggested. My *Arundinax flemingi* is of similar form with the above, but has a square tail; this I would place in the subgenus *Herbivocula*.

117. HERBIVOX CANTANS.

Salicaria cantans, T. & S. Faun. Jap. t. 19; Ibis, 1866, p. 397.

Procured from the interior of Formosa; not known from China.

118. HERBIVOX CANTURIENS.

Arundinax canturiens, Swinh. Ibis, 1860, p. 52, et pp. 131, 357.
Lusciniopsis canturiens, Swinh. Ibis, 1861, pp. 32, 328.
Calamoherpe canturiens, Ibis, 1863, p. 306, 1867, p. 408, 1870, p. 345; P. Z. S. 1863, p. 294.

Hainan to Shanghai, and in Formosa.

119. HERBIVOX MINUTA.

Arundinax minutus, Swinh. Ibis, 1860, p. 52.
Arundinax miniatus, Swinh. Ibis, 1860, p. 357.
Calamoherpe minuta, Ibis, 1863, p. 306, 1870, p. 345; P. Z. S. 1863, p. 294.

Amoy; Hainan; Formosa.

120. HERBIVOCULA FLEMINGI.

Arundinax flemingi, Swinh. P. Z. S. 1870, p. 440.
Salicaria cantillans, P. Z. S. 1862, p. 316, 1863, p. 294.

Tientsin (*Fleming*), Pekin (*David*). I saw two sizes of this in the Paris Museum from Pekin, but I scarcely think they are separable. There was only one specimen of each to judge from. A specimen has been received from Trans-Baikal.

121. CALAMOHERPE CONCINENS, Swinh. P. Z. S. 1870, p. 432.

Pekin.

122. CALAMODUS SORGHOPHILUS.

Calamodyta sorghophila, Swinh. P. Z. S. 1863, pp. 92, 293.
Amoy.

123. DUMETICOLA AFFINIS, Hodgs. Cat. Specim. Brit. Mus. Mamm. & Birds, App. p. 151.

Dumeticola thoracica, Blyth, J. A. S. xiv. p. 584.

Received at the Paris Museum through Père David from the Moupin Mountains. Has also been sent from Lake Baikal.

124. LOCUSTELLA HENDERSONII, Cass. Proc. Phil. Acad. Sciences, 1858, p. 194; P. Z. S. 1863, p. 293.

Locustella rubescens?, Ibis, 1860, p. 358, 1861, pp. 32, 328.
Locustella macropus, Swinh. P. Z. S. 1863, p. 93.
China generally.

125. LOCUSTELLA CERTHIOLA, Pall.

Motacilla certhiola, Pall. Zoogr. p. 509.

Pekin. The Paris Museum has specimens sent by Père David; and I have a head, also sent by him from Pekin. Trans-Baikal (*Tacsanowsky*).

126. LOCUSTELLA RUBESCENS, Blyth, J. A. S. xiv. p. 582.

Locustella ochotensis, Midd. Sib. Reise, t. 16, 17, 18; Ibis, 1863, p. 91; P. Z. S. 1863, p. 293.

Amoy. Received from Trans-Baikal. Found near Calcutta in winter (*Blyth*). Indian specimens have the throat and belly white, and have no yellow on the underparts, and represent the bird in the winter dress. A Baikal specimen in breeding-plumage is yellowish beneath with black spots on the breast. A specimen shot in September at Amoy is intermediate.

127. LOCUSTELLA LANCEOLATA, Temm. Man. d'Ornith. iv. p. 614.

Locustella minuta, Swinh. P. Z. S. 1863, pp. 93, 293; Ibis, 1866, p. 293.
Locustella allied to *L. raii*, Swinh. Ibis, 1861, p. 412.

Amoy; Canton; Pekin (*David*); Lake Baikal (*Tacsanowsky*). Has been shot in Europe.

I have lately received from Trans-Baikal a bird of this group, which I at first thought might be *Calamoherpe maackii*, of V. Schrenck; but it seems to be a novel form, and I would propose to designate it

LOCUSTELLA TACSANOWSKIA, n. sp.

Bill black, bright yellow on the basal half of the lower mandible. Legs and toes yellowish flesh-colour. Upper parts olive-brown; wing- and tail-feathers hair-brown, broadly margined with olive-brown. Underparts and slight superciliary streak yellowish, with the breast, flanks, and tibiæ washed with olive-brown. Length 5 inches; wing 2·2; tail 1·9, much graduated, outer rectrix $\frac{6}{12}$ shortest. First primary of wing broad, ·6 long, second $\frac{1}{2}$ inch shorter than third, which is slightly shorter than the fourth.

The nearest in form to this bird is the *Locustella ochotensis*, from which, however, it can readily be distinguished by its smaller size, short and blunt bill, unspotted upper parts, and light untipped tail.

The Curator of the Museum at Warsaw, M. Tacsanowski, sent this bird to M. Jules Verreaux, labelled *Dumeticola thoracica*, juvenis. It is likely to occur as a winter visitant in China; but as it has not been yet found in that country, I do not number it in my list.

128. TRIBURA LUTEIVENTRIS, Horsf. P. Z. S. 1845, p. 30.

Calamodyta affinis, Gray & Mitch. G. of B. pl. 49.

Sent to the Paris Museum by Père David from Moupin.

129. TRIBURA SQUAMICEPS, Swinhoe, P. Z. S. 1863, p. 292; Ibis, 1866, p. 397.

Canton; Formosa.

130. SYLVIA CURRUCA, Linn. Fn. Suec. 247.

Curruca garrula, Bris. Av. iii. p. 384. n. 7.

Very rare at Pekin, but common at Ordo (*David*). Mr. Gould has a specimen from Kalgan.

131. PHILACANTHA NISORIA (Bechst.).

Nisoria undata, P. Z. S. 1870, p. 430.

Pekin (*David*).

132. OREOPNEUSTE DAVIDII.

Abrornis davidii, Milne-Edwards, Nouv. Arch. d. Mus. 1864, t. i. pl. 2. fig. 1.

In structure this species is neither an *Abrornis* nor a true *Phyllopneuste*, and may with propriety be ranked in a separate genus in company with *P. agricolensis*, Hume, of India. In coloration it resembles my *Arundinax flemingi*, and might at the first glance be mistaken for that bird. It is thus described by Milne-Edwards:—"Above of an olive-brown tint; a greyish-white eye-streak stretches from the base of the beak to the nape, and then curves towards the similar streak on the other side. Throat greyish white; breast and belly tinted on their sides with clear brown, greyish white washed with yellow towards their middle. Tarse yellowish."

Nests in the high mountains near Pekin (*David*).

133. PHYLLOPNEUSTE FUSCATA (Blyth); Swinh. Ibis, 1863, p. 306, 1870, p. 345; P. Z. S. 1863, p. 295.

Phylloscopus fuscatus, Blyth, J. A. S. xi. p. 113, xii. p. 965; Ibis, 1861, pp. 32, 330, 1863, p. 93.

Phyllopneuste sibirica, Midd. Sib. Reise, ii. tab. 16. figs. 4–6.

As in the case of *P. sylvicultrix*, there is certainly much variability in the size and measurements of these brown Willow-Wrens; but I have not yet succeeded in discriminating them as species (*cf.* Tristram, 'Ibis,' 1871, p. 110). I have not been able to detect any differences in the notes and habits of those I have come across. The spotted eggs taken in Formosa, alluded to by Mr. Tristram, cannot, I fear, be trusted to, their authenticity depending on the statement of a Chinaman.

134. PHYLLOPNEUSTE TENELLIPES (Swinh.); P. Z. S. 1863, p. 295.

Phylloscopus tenellipes, Swinh. Ibis, 1860, p. 53.

Amoy; Pekin (*David*).

135. PHYLLOPNEUSTE CORONATA (Temm. & Schleg.); Ibis, 1863, p. 307; P. Z. S. 1863, p. 297.

Phylloscopus coronatus, Ibis, 1860, p. 54, 1861, p. 330, 1863, p. 93; P. Z. S. 1862, p. 317.

Amoy; Pekin (*David*).

136. PHYLLOPNEUSTE XANTHODRYAS, Swinh. P. Z. S. 1863, p. 296.

Amoy.

137. PHYLLOPNEUSTE PLUMBEITARSUS, Swinh. Ibis, 1870, p. 345; P. Z. S. 1863, p. 296.

Phylloscopus plumbeitarsus, Ibis, 1861, p. 330.

A small species with short thick bill and small feet; lesser and greater wing-coverts both tipped with yellow, forming a double bar across the wing; primary quill ·6 in. long, second one-third of an inch shorter than the third.

Pekin; Hainan.

138. PHYLLOPNEUSTE BOREALIS, Blasius, Naumannia, 1858, p. 313; Ibis, 1862, p. 68.

Phylloscopus sylvicultrix, Swinh. Ibis, 1860, p. 53, 1866, pp. 135, 295, 394.

Phyllopneuste sylvicultrix, Ibis, 1863, p. 307; P. Z. S. 1863, p. 295.

Phyllopneuste javanica, Bp. (*nec* Horsf. quæ *Zosterops*), Consp. Av. i. p. 290.

Sylvia (*Phyllopneuste*) *eversmanni*, Midd. (*nec* Bonap.) Sib. Reise, Vög. p. 178, t. 16. f. 1–3.

Sylvia flavescens, G. R. Gray, P. Z. S. 1860, p. 349.

Phyllopneuste kennicotti, Baird, Trans. Chicago Acad. Sci. 1869, i. p. 313, pl. 30. fig. 2.

This Willow-Wren passes through Amoy each spring and autumn in immense numbers; and I have a large series which vary in size and length of parts, but can barely be separated into large and small races, as intermediate sizes occur. I have seen our species from the Tenasserim province, and have two skins of the same from Flores, collected by Mr. Wallace, and marked *S. flavescens*, G. R. Gray. Dr. V. Schrenck has sent me the same from the Kurile Islands labelled *Sylvia eversmanni*; and we have received many from Trans-Baikal through Madame Verdey of Paris. Further, I have examined two specimens from North Russia, collected by M. Mèves, and kindly lent me by Messrs. Salvin and Godman, to whom they belong. These are marked *P. eversmanni*, and are also identical with our China bird. Dr. Hartlaub's *P. borealis* is founded on a specimen from the shores of the sea of Okhotsk; and on carefully reading his description of it, and comparing it with the so-called *P. javanica* (a Java specimen), I find no material difference between them, further than I can match from my series of specimens from China. Finally, Mr. Tristram insists that the type of *P. kennicotti*, Baird, from Alaska, which has been submitted to his inspection, is no other than our Chinese friend. This species thus shows itself to be a great wanderer, resorting in winter to the Malayan peninsula and archipelago, and seeking a summer home in the high latitudes of Asia, extending even to Russia (and apparently to Heligoland) on the European side, and to Alaska on the American side. During its migrations it occurs in Formosa; and I have seen it in the Leyden Museum from Japan.

139. REGULOIDES PROREGULUS (Pall.), Ibis, 1867, p. 408, 1870, p. 345; P. Z. S. 1863, p. 297.

Motacilla proregulus, Pall. Zoogr. i. p. 499.

Reguloides chloronotus, Ibis, 1860, p. 54, 1861, pp. 33, 330.

China generally.

140. REGULOIDES SUPERCILIOSUS, Ibis, 1863, p. 307, 1866, p. 135, 1867, p. 408, 1870, p. 345; P. Z. S. 1863, p. 297.

Motacilla superciliosa, Gmel. Syst. Nat. 1788, i. p. 975.

Reguloides proregulus, Ibis, 1860, p. 54, 1861, pp. 32, 330, 1862, pp. 257, 258.

China generally; Formosa.

141. ABRORNIS FULVIFACIES, Swinhoe, P. Z. S. 1870, p. 132.

Szechuen province.

142. CRYPTOLOPHA TEPHROCEPHALA, Anderson, P. Z. S. 1871, p. 213.

A copy of *Cryptolopha* (olim *Culicipeta*) *burkii*, but with the green of the crown changed to grey. Procured at Bhamo (Burmah) by Dr. Anderson, and sent from Moupin to Paris by Père David.

143. REGULUS JAPONICUS, Bp. Consp. Av.; P. Z. S. 1870, p. 451.

North China.

144. REGULUS HIMALAYENSIS, Blyth; Gould, B. of As. pt. xxi.

Sent from Moupin by Père David to the Paris Museum.

145. RUTICILLA AUROREA (Pall.); Swinhoe, Ibis, 1860, p. 54, 1861, pp. 33, 329, 1862, p. 261, 1863, p. 299, 1870, p. 344; P. Z. S. 1863, p. 291, 1870, p. 438.

Phœnicurus reevesii, Gray, Zool. Misc. p. 1.
Throughout China; Hainan; Formosa.

146. RUTICILLA HODGSONII, Moore, P. Z. S. 1854, pl. 58.

Procured by Père David at Moupin.

147. RUTICILLA RUFIVENTRIS (Vieill.).

Œnanthe rufiventris, Vieill.
Ordo Mountains, N.W. of Pekin and Moupin (*David*).

148. RUTICILLA FRONTALIS, Vig.; Gould, Cent. pl. 26.

Sent by Père David from Moupin; Pekin (*David*).

149. RUTICILLA FULIGINOSA, Vig. P. Z. S. 1831; Ibis, 1861, pp. 409, 410, 1863, p. 298, 1866, p. 399; P. Z. S. 1863, p. 291.

Saxicola leucura (?), Ibis, 1862, p. 257.
Mountain-torrents of Southern China and Formosa.

150. CHÆMARRORNIS LEUCOCEPHALA.

Phœnicura leucocephala, Vig. P. Z. S. 1830; Gould, C. B. pl. 26.

Ichang gorge of the Upper Yangtsze. Sexes similar in colour; the male has a larger foot than the female.

151. LARVIVORA CYANE (Pall.), Ibis, 1866, p. 315.

Motacilla cyane, Pall. Itin. iii. Append. 3, i. p. 472.
Larvivora gracilis, Swinh. Ibis, 1861, pp. 262, 409, 1863, p. 92; P. Z. S. 1862, p. 316, 1863, p. 291.
Larvivora cyanea, Hodgs. (?); Ibis, 1860, p. 358.
China generally.

152. LARVIVORA SIBILANS, Swinh. P. Z. S. 1863, p. 292.

Larvivora ——?, Ibis, 1861, p. 34.
Macao.

153. NOTODELA MONTIUM.

Myiomela montium, Swinh. Ibis, 1864, p. 362, 1866, p. 392.

Formosa. Distinguishable from *M. leucura*, Hodgs., of the Himalayas by the underparts being coloured as the back, instead of being black.

154. IANTHIA CYANURA (Pall.), Ibis, 1861, p. 329, 1863, pp. 91, 298; P. Z. S. 1862, p. 316, 1863, p. 290.

Motacilla cyanura, Pall. Itin. ii. Append. p. 709.
Lusciola cyanura, Faun. Jap. t. 21; Ibis, 1860, p. 131.
Nemura rufilata, Swinh. (nec Hodgs.), Ibis, 1860, p. 54.
Ianthia rufilata, Ibis, 1862, pp. 261, 264.
Throughout China, and in Formosa.

155. TARSIGER CHRYSÆUS, Hodgs.; Jard. Contr. Orn. 1850, pl. 61.

Sent to the Paris Museum by Père David from Moupin.

156. TARSIGER SUPERCILIARIS, Hodgs.; Jard. Contr. Orn. 1849, pl. 29.

Sent to Paris with the last.

157. HODGSONIUS PHŒNICUROIDES, Hodgs. J. A. S. xvi. p. 136.

Callene zonura, J. Verr. Nouv. Arch. 1869, Bull. p. 35.

Received at Paris through Père David from Moupin.

158. ERITHACUS AKAHIGE (Temm.).

In the Museum at Pekin, collected by Père David.

159. COPSYCHUS SAULARIS (L.); Zool. 1858, p. 6228 (*Gryllivora*); Ibis, 1860, p. 54, 1867, p. 409, 1870, p. 343; P. Z. S. 1863, p. 291.

Gracula saularis, Gmel. Syst. Nat. 1788, i. p. 397.
Southern China westwards to Szechuen, and in Hainan.

160. KITTACINCLA MACRURA, var. MINOR, Swinh. Ibis, 1870, p. 344.

Hainan.

161. CYANECULA CÆRULECULA (Pall.); Ibis, 1863, p. 91; P. Z. S. 1863, p. 291.

Cyanecula suecica, Ibis, 1861, p. 329, 1867, p. 394; P. Z. S. 1862, p. 316.
China generally.

162. CALLIOPE CAMTSCHATKENSIS (Gm.); Ibis, 1861, pp. 329, 410, 1863, p. 299; P. Z. S. 1862, p. 316, 1863, 292.

China generally.

163. GRANDALA CŒLICOLOR, Hodgs.; G. R. Gr. & M. Gen. of B. pl. 50.

Sent to Paris from Moupin by Père David.

164. SAXICOLA LEUCOMELA, Pall. Zoogr. t. 28.

Mountains west of Pekin (*David*).

165. SAXICOLA ISABELLINA, Rüpp. Atl. t. 34.

Saxicola saltatrix, Ménétriés.

Inhabits the high plains near Pekin, sings admirably, nests in the deserted holes of *Spermolegus mongolicus* (*David*).

166. SAXICOLA ŒNANTHE, L.

Central mountains of extreme Ordo (north-west of Pekin), where it breeds (*David*).

167. PRATINCOLA INDICA, Blyth, J. A. S. xvi. p. 129; Swinh. Ibis, 1860, p. 54, 1861, pp. 33, 329, 1863, p. 298, 1870, p. 344; P. Z. S. 1862, p. 317, 1863, p. 291.

China generally, Hainan, and Formosa. Distinguishable at all ages from *P. rubicola* by its black axillaries and unspotted uropygials. Chinese specimens are more rust-coloured on the upper parts, and especially on the rump, than Indian ones.

168. PRATINCOLA FERREA, Hodgs. Ibis, 1862, p. 258; P. Z. S. 1863, p. 291.

Ruticilla, sp. nov. ?, Ibis, 1861, p. 33.

South China.

169. ACCENTOR ERYTHROPYGIUS, Swinh. P. Z. S. 1870, p. 124, pl. 9, & p. 447.

Accentor alpinus, Midd. Sib. Reise, Vögel, p. 173.

Western Hills of Pekin in September. Middendorff met with young birds on the cliffs of the south shore of the Sea of Okhotsk in July. Young birds have also been received from the Trans-Baikal region.

170. ACCENTOR NIPALENSIS, Hodgs.

Sent by Père David from Moupin. Has also been received from the Trans-Baikal.

171. ACCENTOR MULTISTRIATUS, David, Ann. Mag. Nat. Hist, April 1871.

Procured by Père David at Moupin. Closely allied to *A. strophiatus*, Hodgs., of the Himalayas.

172. ACCENTOR IMMACULATUS, Hodgs.

Sent by Père David from Moupin.

173. **Accentor montanellus** (Pall.).

Accentor temminckii, Brandt.

Comes to Pekin with the great cold (*David*). Sent in summer plumage from the Trans-Baikal.

174. **Accentor rubidus**, Temm. & Schleg. F. J. t. 32.

Père David saw the head of a bird procured at Pekin, which he identified with that of *A. modularis*, L.

175. **Parus minor**, Temm. & Schleg. F. J. t. 33; Swinh. Zool. 1858, p. 6229; Ibis, 1860, p. 55 et p. 131, 1861, p. 332, 1862, p. 257; P. Z. S. 1870, p. 437.

Amoy to Pekin, and westwards to Szechuen.

176. **Parus cæsius**, Tickell.

Parus cinereus, Ibis, 1870, p. 348.

Hainan. Our specimens agree with those from India. The Java bird, *P. cinereus*, Vieill. (*P. atriceps*, Horsf.), can be readily distinguished by the black of the head extending beyond the white nuchal spot, and separating it from the grey of the back.

177. **Parus commixtus**, Swinh. Ibis, 1868, p. 63.

Parus minor, Ibis, 1861, p. 34; P. Z. S. 1863, p. 270.

Like *P. cæsius*, but with some of the green tint on the back that marks *P. minor*, in fact intermediate to the two species. Canton to Foochow.

178. **Parus monticola**, Vig.; Gould, C. B. pl. 29.

Sent by Père David from Moupin to the Paris Museum.

179. **Parus insperatus**, Swinh. Ibis, 1866, p. 308.

South Formosa. A smaller race than the last, with the white on the tips of the tertiary quills confined to their tips, and not extending to their margins; barely separable.

180. **Parus venustulus**, Swinhoe, P. Z. S. 1870, p. 133.

Ichang Gorge, on the Upper Yangtsze.

181. **Parus castaneiventris**, Gould, P. Z. S. 1862, p. 280; B. of As. pl.; Ibis, 1863, p. 295.

North Formosa.

182. **Parus pekinensis**, David; Ibis, 1870, p. 155.

Pekin. Very like *Parus ater*, L., but with a few of the black coronal feathers lengthened and showing conspicuously over the white nuchal spot.

183. Pœcile kamtschatkensis, Bp.

Parus palustris, Ibis, 1861, p. 331.
Parus kamtschatkensis, P. Z. S. 1863, p. 270, 1870, p. 437.

Resident at Pekin (*David*). Among specimens of this species received from Trans-Baikal through M. Tacsanowsky is a very interesting form of Marsh-Tit, remarkable for its resemblance to the American *P. carolinensis*. This I have named *P. baicalensis* (Ann. & Mag. Nat. Hist. April 1871).

184. Pœcile cincta (Bodd.).

Parus sibiricus, Gm.

Woody mountains west of Pekin (*David*). From Moupin Père David has sent to Paris a handsome *Machlolophus*, which has not yet been described.

185. Orites glaucogularis (Gould).

Mecistura swinhoii, v. Pelzeln, Reise v. d. Novara, t. 3.
Mecistura caudata, P. Z. S. 1863, p. 270.
Parus trivirgatus, Ibis, 1860, p. 131.
Ningpo to Pekin, and westwards to Ichang.

186. Orites ouratensis, David, M. S.; Swinhoe, P. Z. S. 1870, p. 430.

A species of *Orites* with red eyelids was in the Pekin Museum, and has been sent to Paris. It was found by Père David in the mountains west of Pekin. It has not yet been described.

187. Ægithaliscus concinnus.

Ægithaliscus anophrys, Swinh. Ibis, 1868, p. 64.
Psaltria concinna, Gould, B. of Asia, pt. vii.
Fokien and Chekiang Provinces, and westward to Szechuen.

188. Ægithaliscus fuliginosus.

Mecistura fuliginosa, J. Verr. Nouvelles Arch. du Muséum, t. viii. Bulletin, p. 36.

"General colour dusky brown, forming a brown band on the breast; face and throat silvery grey; a half collar on the anterior part of the neck and middle of the abdomen, pure white on the first, and taking a rosy tint on the flanks; wings and tail brown, the latter white on the external barbs of the four lateral quills." (*J. Verreaux.*)
Sent by Père David from Moupin.

189. Ægithalus consobrinus, Swinh. P. Z. S. 1870, p. 133.

Ægithalus pendulinus, Radde, Reisen, Band ii. p. 195.

Procured at Sha-se, near Ichang (Hoopih). Radde found it breeding in Amoorland.

190. Sylviparus modestus, Burton, P. Z. S. 1835, p. 154.

Sent from Moupin by Père David.

191. MOTACILLA ALBOIDES, Hodgs., var. 1. FELIX.

Motacilla luzoniensis, Ibis, 1860, pp. 55, 429, 1861, p. 35, 1862, p. 259, 1863, p. 308; P. Z. S. 1863, p. 274.

Motacilla felix, Swinh. P. Z. S. 1870, p. 121, fig. 1.

Like the Indian black-backed *M. alboides* (*leucopsis*, Gould, *luzoniensis*, auct.), but with the pectoral black, in summer plumage, advancing higher, to within half an inch of the lower mandible. Southern China and Formosa.

Var. 2. SECHUENENSIS, Swinh. P. Z. S. 1870, p. 122, fig. 2.

The pectoral black in summer reaching to the lower mandible.

Szechuen (W. China).

192. MOTACILLA PARADOXA, v. Schrenck, Amurland, Vög. p. 341, t. xi. fig. 2.

The pectoral black forming a large round patch on the breast.

Mongolia. Forwarded to Paris by Père David.

193. MOTACILLA HODGSONI, G. R. Gray; Blyth, Ibis, 1865, p. 49.

Motacilla francisci, Swinh. P. Z. S. 1870, p. 123; Ibis, 1870, p. 345.

Like *M. personata*, Gould, of India, but with the back black instead of grey.

Hainan; Szechuen, extending to Nepal.

194. MOTACILLA FRONTATA, Swinh. P. Z. S. 1870, p. 129.

Motacilla, sp.?, Ibis, 1867, p. 390.

Amoy in winter.

195. MOTACILLA BAICALENSIS, n. sp.

Motacilla dukhunensis (?), P. Z. S. 1870, p. 130.

The representative in Eastern Asia of *M. alba*, L., of Europe; with clearer plumage, smaller bill, wing of a lighter brown, with much more white, especially on the wing-coverts. In full summer plumage the pectoral black contracts on the throat, and falls short of the chin. It has a very close ally in *M. dukhunensis*, Sykes, of India, but may be distinguished from that by its larger bill, greater amount of white on the wing-coverts; and in nuptial dress by the form of the pectoral patch. Occasional specimens from Trans-Baikal have a black line uniting the back of the eye with the black of the nape, but otherwise similar to the typical bird. This I would propose to distinguish as var. *temporalis*. It will probably be the bird procured in Lombardy in the collection of Count Turati of Milan (see Baron de Selys-Longchamps in Ibis, 1870, p. 451). Numerous skins of the Baikal Wagtail have been received through Madame Verdey of Paris; and it is doubtless the species observed by me on the Upper Yangtsze (P. Z. S. 1870, p. 130).

196. Motacilla ocularis, Swinh. Ibis, 1863, pp. 94, 309; P. Z. S. 1863, pp. 275, 1870, p. 130, fig. 346.

Motacilla lugubris, Ibis, 1860, p. 55, 1861, pp. 35, 255, 333, 1862, p. 260; P. Z. S. 1862, p. 317.

Distinguishable in all plumages by the dark streak through its eye and its grey back.

China, Hainan, and Formosa. Specimens have also been received from Trans-Baikal.

197. Motacilla japonica, Swinh. P. Z. S. 1863, pp. 17, 274, 1870, p. 130.

Motacilla lugens, Temm. (nec Illig.); Ibis, 1860, p. 357.
Motacilla lugubris, Ibis, 1862, p. 260, 1863, p. 308.
Motacilla alba, var. from Kamtschatka, Pall. Zoograph.

Distinguishable from the last in winter by its larger size, its whiter wing, and black-marked back. This is the species that announces the return of spring to the Kamtschatkans (*Kittlitz*). *M. lugubris,* Pall. & Temm. (*lugens,* Illiger), is the *M. vidua,* Sundevall, of Africa (see Tristram, 'Ibis,' 1866, p. 291).

198. Budytes flavus (L.); Swinh. Ibis, 1860, p. 55, 1861, pp. 36, 333, 411, 1862, p. 260; P. Z. S. 1863, p. 274.

Budytes flavescens, G. R. Gray, P. Z. S. 1860, p. 350.

China generally. Mr. Wallace has bright-plumaged birds from the Moluccas which also agree with the European species; and Mr. Baird reports it from Alaska.

199. Budytes taivanus, Swinh. Ibis, 1870, p. 346, 1866, p. 138.

Budytes rayi?, Ibis, 1862, p. 260, 1863, p. 309.
Budytes melanotis, Ibis, 1864, p. 422.

Amoy; Formosa; Hainan. I have a specimen also from Trans-Baikal; and Mr. Gould has one from Singapore.

200. Budytes cinereocapillus, Sav.; Ibis, 1863, p. 94, 1870, p. 346; P. Z. S. 1862, p. 317.

Occurs singly or in pairs throughout China in spring.

201. Budytes citreolus (Pall.).

Szechuen. I came across a party of this Wagtail on the Upper Yangtsze in May.

202. Calobates melanope.

Motacilla melanope, Pall. Itin. iii. p. 696. n. 16; Zoogr. i. p. 500.
Motacilla bistrigata, Raffles, Trans. Linn. Soc. xiii. part 2, p. 312.
Motacilla boarula, Ibis, 1860, p. 55, 1861, pp. 35, 333, 1862, p. 260, 1863, p. 309, 1866, p. 138; P. Z. S. 1862, p. 317, 1863, p. 274.
Calobates boarula, Ibis, 1870, p. 346.

China; Formosa; Hainan. Like *C. boarula*, but with a constantly shorter tail.

203. LIMONIDROMUS INDICUS (Gmel.); Gould, B. of As. pt. xiv.

Nemoricola indica, Ibis, 1861, p. 333, 1863, p. 94; P. Z. S. 1862, p. 317, 1863, p. 276, 1870, p. 433.

Pekin and Szechuen.

204. HENICURUS SINENSIS, Gould, P. Z. S. 1865, p. 665; Ibis, 1867, p. 404.

Henicurus chinensis, Gould, B. of As. pt. xviii.
Henicurus leschenaultii, P. Z. S. 1863, p. 276.
Enicurus speciosus, Ibis, 1861, p. 265, 1862, pp. 261, 264.

Fokien province.

205. HENICURUS LEUCOSCHISTUS, Swinh. Ann. & Mag. N. H. vol. vi. 4th series, p. 154.

Enicurus schistaceus, Ibis, 1861, pp. 409, 410; P. Z. S. 1863, p. 276.

Fokien; Moupin (*David*). Like *H. schistaceus*, Hodgs., of Nepal, but wants the white tips that mark the first to the sixth primaries of the Indian bird, and its under wing instead of having the bases of the primary quills white, commencing from the second quill and increasing inwards, has the basal third of the quills edged on their inner webs with white, commencing from the fourth quill inclusive.

206. HENICURUS SCOULERI, Vig.; Gould, B. of Asia, pt. xviii.

Moupin (*David*).

207. ANTHUS SPINOLETTA, L.

Anthus aquaticus, Bechst.
Anthus blakistoni, Swinh. P. Z. S. 1863, pp. 90, 273; Ibis, 1867, p. 389.

Amoy; river Yangtsze. I have seen a specimen of the true *A. obscurus*, Gmel., from India.

208. ANTHUS CERVINUS, Pall. Zoograph. i. p. 511; Ibis, 1870, p. 347; P. Z. S. 1863, p. 273.

Anthus thermophilus, Ibis, 1860, pp. 55, 429, 1861, pp. 36, 411, 1863, p. 311.
Anthus japonicus, Ibis, 1861, p. 333.

Throughout China; Hainan; Formosa. It is a mistake to identify the European *A. cecilii*, Audouin (= *A. rufogularis*, Brehm), with our eastern *A. cervinus*. Ours is a smaller bird, with shorter wing, and in summer is easily distinguished by the rosy hue of its eyebrow and breast, which in the other are rust-colour, the breast being streaked with black. The streaks on the flanks, too, in the latter are much longer and broader.

209. **Anthus rosaceus**, Hodgs.

Sent from Moupin by Père David.

210. **Pipastes agilis** (Sykes); Gould, B. of As. pt. xvii.; Ibis, 1870, p. 347.

Anthus agilis, Ibis, 1860, p. 55, 1861, pp. 36, 333, 1863, p. 310; P. Z. S. 1863, p. 273.

Throughout China; Hainan; Formosa.

211. **Corydalla gustavi.**

Anthus gustavi, Swinh. P. Z. S. 1863, pp. 90, 273.

Anthus batchianensis, G. R. Gray, Hand-list, p. 251.

Comes to Amoy in spring in large numbers; but whither it goes I cannot tell. Mr. Wallace procured the same species in Batchian.

212. **Corydalla richardi** (Vieill.), Pl. Col. 101; Ibis, 1870, p. 347.

Anthus richardi, Ibis, 1860, p. 55, 1861, pp. 36, 333, 1863, p. 311, 1865, p. 234; P. Z. S. 1862, p. 317, 1863, p. 272.

Corydalla infuscata, Blyth. (Race that breeds on the Fokien Hills.)

Corydalla sinensis, Ibis, 1861, p. 265.

Throughout China; Hainan. Rare in Formosa.

213. **Corydalla chinensis**, Bp. Consp. Av. i. p. 525.

A smaller and more ochreous race than the last. Amoy in spring.

214. **Turdus naumanni**, Temm. Man. d'Orn. i. p. 170; Ibis, 1863, p. 277; P. Z. S. 1863, p. 280.

Shanghai to Pekin, and westwards to Szechuen.

215. **Turdus fuscatus**, Pall. Zoogr. i. p. 451; Ibis, 1863, pp. 93, 277; P. Z. S. 1862, p. 317, 1863, p. 280.

Amoy to Pekin, and in Formosa; westwards to Szechuen.

216. **Turdus musicus**, L.

Foochow (*Gould*), Pekin (*David*). I have compared this bird, in company with Mr. Gould, with other specimens of the species. The Chinese bird does show some differences from home-shot examples, but a bird from Malta differs still more.

217. **Turdus ruficollis**, Pall. It. iii. p. 694; Gmel. Syst. Nat. 1788, p. 815; P. Z. S. 1863, p. 281.

Turdus —— ?, Ibis, 1861, p. 332.

Pekin; Moupin (*David*).

218. **Turdus pallidus**, Gmel. Syst. Nat. 1788, p. 815; Pl. Col. 515; Ibis, 1863, p. 276.

Turdus daulias, Temm. Faun. Japon. t. 26; Ibis, 1860, p. 56, 1861, p. 57, 1862, p. 261; P. Z. S. 1863, p. 280.

Turdus advena, Swinh. Ibis, 1860, pp. 56, 358.
Amoy to Peking; Formosa.

219. Turdus chrysolaus, Temm. Pl. Col. 537; Ibis, 1860, p. 56, 1863, p. 276, 1870, p. 248; P. Z. S. 1863, p. 280.

Hainan to Pekin; Formosa.

220. Turdus obscurus, Gmel. Syst. Nat. 1788, p. 816; Ibis, 1863, p. 277.

Turdus pallens, Pall.; Ibis, 1860, p. 56, 1861, p. 37, 1863, p. 93; P. Z. S. 1862, p. 317, 1863, p. 280.
Turdus rufulus, Drap.
Turdus modestus, Eyton.
Turdus pallidus, Ibis, 1861, p. 332.
Turdus davidianus, Milne-Edwards, Nouv. Arch. i. Bull. p. 26.

Malacca to Pekin, and westwards to Szechuen; Formosa. To be at once distinguished from the last by its conspicuous white eyebrow.

221. Turdus hortulorum, Sclater, Ibis, 1863, p. 196; P. Z. S. 1863, p. 280.

Turdus ——?, Ibis, 1861, p. 37.
South China.

222. Turdus albiceps, Swinh. Ibis, 1864, p. 363, 1866, p. 135, pl. 5, & p. 315.

Formosa.

223. Turdus cardis, Temm. Pl. Col. 518; Ibis, 1860, p. 132, 1861, p. 37, 1870, p. 248; P. Z. S. 1863, p. 280.

South China in winter.

224. Turdus sibiricus, Pall. It. iii. p. 694; Syst. Nat. 1788, p. 815; Ibis, 1861, p. 410, 1863, p. 93; P. Z. S. 1862, p. 317, 1863, p. 279.

Geocichla, n. sp., Ibis, 1861, p. 37.

A winter straggler in China generally.

225. Merula sinensis (Cuv.); G. R. Gray, Hand-list of B. i. p. 255; Zool. 1858, p. 6228.

Turdus mandarinus, Bp.; Ibis, 1860, p. 56, 1861, p. 38, 1870, p. 248; P. Z. S. 1863, p. 281.

Hainan to Shanghai, and westwards to Szechuen. A fine chestnut-coloured species, allied to *M. castanea* (Gould) of India, has been sent to Paris by Père David from Moupin.

226. Oreocincla varia (Pall.).

Turdus varius, Pall. Zoogr. i. p. 449.
Oreocincla aurea, Bp.; Ibis, 1860, p. 56; P. Z. S. 1863, p. 278.

Oreocincla hancii, Swinh. Ibis, 1863, p. 275, 1866, p. 304.
Oreocincla whitei, Ibis, 1861, p. 333.

China generally, and in Formosa.

227. OREOCINCLA MOLLISSIMA.

Turdus mollissimus, Blyth, J. A. S. xi. p. 185.

Sent by Père David from Moupin.

228. MONTICOLA SAXATILIS, L.

Summers on the Pekin Mountains (*David*).

229. PETROPHILA GULARIS.

Orœcetes gularis, Swinh. Ibis, 1863, p. 93, pl. 3; P. Z. S. 1862, p. 318, 1863, p. 282.
Monticola ——?, Ibis, 1861, p. 332.

Breeds on the Pekin Mountains (*David*).

230. PETROCINCLA MANILLA (Bodd.); Ibis, 1870, p. 248.

Petrocincla violacea, Swinh. Zool. 1858, p. 6228.
Petrocincla manillensis, Ibis, 1863, p. 274, 1866, p. 136, 1867, pp. 233, 404; P. Z. S. 1862, p. 317, 1863, p. 281.
Petrocossyphus manillensis, Ibis, 1860, pp. 56, 429, 1861, p. 38, 1862, p. 307, 1863, p. 93.

Hainan to Tientsin, and in Formosa.

231. PETROCINCLA CYANEA (L.).

Interior of China. Common in the gorges of the Upper Yangtsze. Rare at Amoy and on the Chinese coast.

232. PETROCINCLA AFFINIS, Blyth, J. A. S. xii. p. 177.

Smaller than *P. manilla*, with the vent and belly more or less red; intermediate between *P. manilla* and *P. cyanea*. The common form on the South-China coast.

233. MYIOPHONEUS CÆRULEUS (Scop.); Ibis, 1861, p. 36, 1862, pp. 262, 264; P. Z. S. 1863, p. 277.

Myiophoneus horsfieldii, Vigors?; Ibis, 1860, p. 55.
Turdus violaceus, Gmel. Syst. Nat. 1788, p. 826.
Turdus nitidus, Gray, Zool. Misc. p. 1.

South China, westwards to Szechuen.

234. MYIOPHONEUS INSULARIS, Gould, P. Z. S. 1862, p. 180; B. of As. pl.; Ibis, 1863, p. 577.

Formosa.

235. HYDROBATA PALLASI, Temm. Man. d'Ornith. iii. p. 107.

Cinclus pallasi, Ibis, 1863, p. 272; P. Z. S. 1863, p. 277.

H. marila, Swinh. North China Asiat. Soc. Journ. May 1859; Ibis, 1860, pp. 187, 360.

Formosa, Ichang gorge of the Upper Yangtsze.

236. HYPSIPETES LEUCOCEPHALUS.

Turdus leucocephalus, Gmel. Syst. Nat. 1788, p. 826.
T. melaleucus, Gray, Zool. Misc. p. 1.
H. niveiceps, Swinh. Ibis, 1864, p. 424, 1865, p. 107.
South China to Szechuen.

237. HYPSIPETES NIGERRIMUS, Gould, P. Z. S. 1862, p. 282; B. of As. pt. xvi.; Ibis, 1863, p. 287.

Formosa.

238. HYPSIPETES PERNIGER, Swinh. Ibis, 1870, p. 251, pl. 9. fig. 2.

Hainan.

239. HYPSIPETES YUNANENSIS, Anderson, P. Z. S. 1871, *anteà*, p. 213.

Procured by Dr. Anderson at Ponsee (Yunnan province).

240. HYPSIPETES MACCLELLANDI, Horsf. P. Z. S. 1839, p. 159.

H. holti, Swinhoe, Ibis, 1861, pp. 266, 409; P. Z. S. 1863, p. 277.

Fokien province.

241. HEMIXUS CASTANONOTUS, Swinh. Ibis, 1870, p. 251, pl. 9. fig. 1.

Hainan.

242. IXUS SINENSIS, Ibis, 1863, p. 289; P. Z. S. 1863, p. 278.

Muscicapa sinensis, Gmel. Syst. Nat. 1788, i. p. 942.
Pycnonotus sinensis, Ibis, 1860, p. 57.
P. occipitalis, Ibis, 1861, p. 39.

Luichow to Shanghai, and westward to Szechuen, also in Formosa. Shanghai samples are larger, with the black of the crown somewhat obscuring the white of the occiput; Szechuen specimens have the occiput very white, with a pale halter mark round the neck; but both these varieties occasionally occur at Amoy.

243. IXUS HAINANUS, Swinh. Ibis, 1870, p. 253.

Like the last, but with the occiput, as well as the crown, black.
Hainan.

244. IXUS XANTHORRHOUS.

Pycnonotus xanthorrhous, Anderson, Proc. Asiat. Soc. Beng. 1869, p. 265.

Ixus andersoni, Swinh. Ann. & Mag. Nat. Hist. vol. v. 4th series, p. 175.

Ichang gorge of the Upper Yangtsze. Obtained also by Dr. Anderson at Momien (province Yunnan), and by Père David in Kokonor.

245. IXUS CHRYSORRHOIDES (Lafr.); Ibis, 1867, p. 232, 1868, p. 63; P. Z. S. 1863, p. 278.

Hæmatornis chrysorrhoides, Lafr. Rev. Zool. 1845, p. 367.
Pycnonotus hæmorrhous, Ibis, 1860, p. 57.
Muscicapa atricapilla, Vieill.; Ibis, 1860, p. 358.
Pycnonotus chrysorrhoides, Ibis, 1861, p. 39.
Ixus hæmorrhous, Ibis, 1862, p. 307.
South China.

246. IXUS JOCOSUS (L.); P. Z. S. 1863, p. 277.

Pycnonotus jocosus (L.); Ibis, 1861, p. 39.
Canton.

247. SPIZIXUS SEMITORQUES, Swinh. Ibis, 1861, p. 266; P. Z. S. 1863, p. 278.

Fokien province, and westwards in the Ichang gorge.

248. SPIZIXUS CINEREICAPILLUS, n. sp.

Sp. semitorques, Swinh. Ibis, 1863, p. 290.

I identified the Formosan bird with the China species from a specimen injured about the head. The acquisition of a series from the Formosan mountains establishes the distinction between the two. The Formosan race is like the China bird, but has the dark parts of the head grey instead of black.

249. CRINIGER PALLIDUS, Swinh. Ibis, 1870, p. 252.

Hainan.

250. PHYLLORNIS LAZULINA, Swinh. Ibis, 1870, p. 255.

Hainan.

251. SIBIA AURICULARIS (Swinh.); Sclater, Ibis, 1866, p. 109, pl. 4, p. 401.

Kittacincla auricularis, Swinh. Ibis, 1864, p. 361.
Formosa.

252. POMATORHINUS ERYTHROCNEMIS, Gould, P. Z. S. 1862, p. 281; B. of As. pl.; Ibis, 1863, p. 286.

Formosa.

253. POMATORHINUS MUSICUS, Swinh. North China Asiat. Soc. Journ. May 1859; Ibis, 1860, pp. 187, 360, 1861, p. 284, pl. 6.

Formosa.

254. POMATORHINUS STRIDULUS, Swinh. Ibis, 1861, p. 265; P. Z. S. 1863, p. 278.

South China, westwards to Szechuen.

255. POMATORHINUS NIGRO-STELLATUS, Swinh. Ibis, 1870, p. 250.

Hainan.

256. PTERORHINUS DAVIDI, Swinh. Ibis, 1868, p. 61.

Western mountains of Pekin; a fine songster. Two other species of this genus have been received from Moupin at Paris; they will be described by M. J. Verreaux.

257. LEUCODIOPTRUM CHINENSE.

Turdus chinensis, Osb. Itin. 309.
Turdus sinensis, Gmel. Syst. Nat. 1788, p. 826.
Garrulax canorus, Ibis, 1860, p. 358, 1861, p. 38.
Leucodioptrum sinense, Ibis, 1870, p. 250; P. Z. S. 1863, p. 278.
Hainan to Ningpo.

258. LEUCODIOPTRUM TAIVANUM.

Garrulax taëwanus, Swinh. Journ. North China Asiat. Soc. May 1859, no. 2, p. 228; Ibis, 1860, pp. 187, 360, 1863, p. 279.
Malacocercus taivanus, Ibis, 1865, p. 546.
Formosa.

259. GARRULAX CHINENSIS (Scop.); Sonn. Voy. t. 107; Ibis, 1864, p. 423.

Turdus shanku, Gmel. Syst. Nat. 1788, p. 814.
Garrulax auritus (Daudin); Ibis, 1865, p. 350.
South-west Kwangtung.

260. GARRULAX PERSPICILLATUS (Gmel.); Pl. En. 604; Ibis, 1861, p. 38, 1862, p. 306; P. Z. S. 1863, p. 278.

Garrulax rugillatus, Swinh. Ibis, 1860, pp. 57, 358.
Turdus perspicillatus, Gmel. Syst. Nat. 1788, i. p. 830.
Canton to Ningpo, and westward to Szechuen.

261. GARRULAX ALBOGULARIS (Gould, P. Z. S. 1835, p. 187).

Sent from Moupin by Père David.

262. GARRULAX RUFICEPS, Gould, P. Z. S. 1862, p. 281; B. of As. pl.; Ibis, 1863, p. 282.

Formosa. Like the last, but with a rufous cap.

263. GARRULAX SANNIO, Swinh. Ibis, 1867, p. 403.

South China, and westwards to Szechuen. Procured in Western Yunnan by Dr. Anderson.

264. GARRULAX MONACHUS, Swinh. Ibis, 1870, p. 248.

Hainan.

265. IANTHOCINCLA PŒCILORHYNCHA (Gould).

Garrulax pœcilorhynchus, Gould, P. Z. S. 1862, p. 281; B. of As. pl.; Ibis, 1863, p. 283, 1866, p. 303.

Formosa.

266. CINCLOSOMA ARTEMISIÆ, David, Ann. & Mag. Nat. Hist. April 1871, p. 256.

Allied to *C. ocellatum*, Vigors, of the Himalayas. Procured by Père David at Moupin, Western Szechuen.

267. TROCHALOPTERUM FORMOSUM, J. Verr. Nouv. Arch. 1869, Bull. p. 35.

"General tint olivaceous rust-colour; head grey, lanceolated with black; throat and front of neck of this last colour; a great portion of the wings and of the upper surface of the tail blood-red. Belly and abdomen olivaceous."—*J. Verreaux.*

Sent by Père David from Moupin. Two other species of this genus, also from Moupin, remain to be described.

268. CONOSTOMA ÆMODIUM, Hodgs. J. A. S. x. p. 856.

Sent from Moupin by Père David.

269. PARADOXORNIS FLAVIROSTRIS, Gould, P. Z. S. 1836, p. 17.

Sent from Moupin by Père David.

270. HETEROMORPHA UNICOLOR, Hodgs. J. A. S. xii. p. 448.

Sent from Moupin by Père David. Like this in coloration is a curious species, also from Moupin, with one of its toes rudimentary.

271. SUTHORA BULOMACHUS, Swinh. Ibis, 1866, pp. 299, 303, pl. 9.

The lower hills of Formosa.

272. SUTHORA SUFFUSA, n. sp.

A smaller conspecies of the last, with the hind neck of a richer rufous and more definitely separated from the greyish olive of the back. Back washed with rufous in the other, blending with the rufous of the head. Bill smaller. Legs and feet much smaller; wing 2 inches, tail 2·5.

Seen in small parties in spring about the mountainous sides of the gorges on the Upper Yangtsze.

273. SUTHORA WEBBIANA, G. R. Gray, P. Z. S. 1852, p. 70; Gould, B. of As. pl.; P. Z. S. 1863, p. 271.

Abundant about the hedges near Ningpo and Shanghai; mountains of Pekin (*David*). Kept in Shanghai for its fighting-qualities.

Like its Formosan congener it is very pugnacious, and will fight its fellows to the death. The Chinese use it in the gambling-ring.

274. SUTHORA GULARIS, J. Verr. Nouv. Arch. 1869, Bulletin, p. 35.

"Couleur générale laque jaune, devenant blanche sur les joues et le milieu de la partie inférieure excepté la gorge, qui est d'un noir pur; rémiges et rectrices noirâtres; partie supérieure de ces dernières rougeâtres, une tache jaune mordorée sur le milieu de l'aile s'étendant sur une partie des secondaires."—*J. Verreaux.*

Sent by Père David from Moupin. Père David has also sent another species hitherto undescribed from the same locality.

275. SUTHORA BRUNNEA, Anderson, P. Z. S. 1870, *anteà*, p. 211.

Procured by Dr. Anderson at Momien (Yunnan province).

276. LEIOTHRIX LUTEA (Scop.); Ibis, 1865, p. 349; P. Z. S. 1863, p. 298.

South-west China, whence brought to Canton and sold alive in bird-shops.

Père David has sent a new *Minla* from Moupin, allied to *M. ignitincta*, Hodgs., of the Himalayas.

277. YUHINA NIGRIMENTUM, Hodgs. J. A. S. xiv. p. 562.

Sent by Père David from Moupin.

278. YUHINA DIADEMATA, J. Verr. Nouv. Arch. 1869, Bull. p. 35.

"Couleur générale brun terreux, plus pâle en dessus; milieu de l'abdomen, les couvertures sous-caudales blanc pur, devenant d'une teinte encore plus pure sur la grande tache occipitale, qui est précédée par de longues plumes formant une huppe; ailes et queue noires avec les rachis d'un blanc plus visible sur la dernière, qui est échancrée."—*J. Verreaux.*

Sent by Père David from Moupin.

279. STACHYRIS PRÆCOGNITUS, Swinh. Ibis, 1866, p. 310.

Very like *St. ruficeps*, Blyth, of Nepal, but smaller, with much smaller bill, and with the red of the head confined to the crown.

Formosa; Ichang gorge of the Yangtsze river.

280. HERPORNIS TYRANNULUS, Swinh. Ibis, 1870, p. 347, pl. 10.

Herpornis xanthochlora, Swinh. Ibis, 1863, p. 293.
Herpornis xantholeuca, Swinh. Ibis, 1866, p. 394.

Formosa; Hainan.

281. STAPHIDA TORQUEOLA.

Siva torqueola, Swinh. Ann. & Mag. Nat. Hist. vol. v. 4th series, p. 174.

I described this as a *Siva*; but it is more allied to the genus *Ixulus*, from which it differs in having a deeply graduated tail. *Ixulus castaneiceps*, Moore, is of the same form as our bird; and I would propose to place these two under a new subgenus, *Staphida*. Our species was procured in Fokien province. Père David has sent a new species of *Ixulus* from Moupin.

282. ALCIPPE NIPALENSIS.

Sent from Moupin by Père David.

283. ALCIPPE MORRISONIA, Swinh. Ibis, 1863, p. 296, 1865, p. 107.

Formosa. A smaller conspecies of the last.

284. ALCIPPE BRUNNEA, Gould, P. Z. S. 1862, p. 280, B. of As. pl.; Ibis, 1863, p. 297.

Formosa.

285. COCHOA VIRIDIS, Hodgs. J. A. S. v. p. 359; Ibis, 1868, p. 354.

A single specimen procured at Amoy in December 1867. The Paris Museum has received the bird from Cochin-China.

286. AMPELIS GARRULA (L.); P. Z. S. 1863, p. 298.

North China.

287. AMPELIS PHŒNICOPTERA, Temm. F. J.; Ibis, 1864, p. 427, 1866, p. 307.

North China; Formosa.

288. PSAROPHOLUS ARDENS, Swinh. Ibis, 1862, p. 363, 1863, p. 293, 1866, pp. 297, 398.

Formosa.

289. PSAROPHOLUS ARDENS, var. NIGELLICAUDA, Swinh. Ibis, 1870, p. 342.

Hainan.

290. ORIOLUS CHINENSIS, Gmel. Syst. Nat. 1788, p. 383; Swinh. Ibis, 1860, p. 57, 1861, pp. 58, 341, 1863, p. 291, 1866, p. 138, 1870, p. 342; P. Z. S. 1863, p. 282.

Oriolus cochinensis, Briss. Av. ii. p. 326.
Oriolus indicus, Jerd. Ill. Ind. Orn. pl.

Throughout China, and Formosa in summer. Resorts in winter to Cochin-China, Tenasserim, and India.

291. PITTA MOLUCCENSIS (Müll.).

Turdus moluccensis, P. L. S. Müller, Natursyst. Anhang (1766), p. 144.
Pitta cyanoptera, Temm.

Pitta nympha, Swinh. Ibis, 1861, pp. 412, 414; P. Z. S. 1863, p. 277.

A single specimen procured at Amoy.

292. PITTA OREAS, Swinh. Ibis, 1864, p. 428.

Formosa.

293. LANIUS LAHTORA (Sykes, P. Z. S. 1832, p. 86); Sharpe and Dresser, P. Z. S. 1870, p. 595.

Pekin in winter (*David*).

294. LANIUS MAJOR, Pall. Zoogr. i. p. 401.

Rare at Pekin (*David*). Under the name *L. mollis*, Eversm.*, a specimen of this has been sent from Trans-Baikal.

295. LANIUS SCHACH, L.; Zool. 1858, p. 6228; Ibis, 1860, p. 59, 1861, p. 43, 1865, p. 356, 1870, p. 240; P. Z. S. 1863, p. 286.

Lanius chinensis, Gray, Zool. Misc. p. 1.
Lanius schach, var. *formosæ*, Ibis, 1863, p. 270.
China generally; Formosa; Hainan.

296. LANIUS TEPHRONOTUS (Vig. P. Z. S. 1831, p. 43).

Sent by Père David from Moupin.

297. LANIUS FUSCATUS, Less.; Walden, Ibis, 1868, p. 69, 1870, p. 241.

Lanius melanthes, Swinh. Ibis, 1867, p. 405.
South China; Hainan.

298. LANIUS MAGNIROSTRIS, Less.; Ibis, 1867, pl. 6.

Lanius waldeni, Swinh. P. Z. S. 1870, p. 131, pl. 11.

Comes from Malacca to Central China to breed. Female, when fully adult, like the male.

299. LANIUS BUCEPHALUS, Temm. & Schleg. Faun. Jap. t. 14; Ibis, 1860, pp. 60 et 132, 1861, p. 340; P. Z. S. 1862, p. 319, 1863, p. 287.

Pekin; Amoy (one female specimen procured in winter). Male differs much from the female.

300. LANIUS CRISTATUS, L.; Gmel. Syst. Nat. 1788, p. 298.

Lanius phœnicurus, Pall.

Upper parts reddish brown; crown the same from the base of the beak; eyebrow yellowish and not well defined. A male from Amoy agrees with examples from India. Adult female resembles the male. Received frequently in full summer plumage from Trans-Baikal.

301. LANIUS SUPERCILIOSUS, L.

Rather brighter than the last; forehead and well-defined eye-

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[* *Cf.* Ann. Nat. Hist. ser. 2, xvii. p. 78.—ED.]

brow white. A male from Amoy agrees with specimens from the Amoor and Malacca. Adult female resembles the male.

302. Lanius lucionensis, L.; Gmel. Syst. Nat. 1788, p. 299; Ibis, 1860, p. 59, 1861, pp. 43, 255, 340, 1863, p. 272, 1866, pp. 135, 295, 394; P. Z. S. 1863, p. 286, 1870, p. 428.

Lanius schwaneri, Bp. Consp. Av. i. p. 363.

Upper parts light liver-brown; forehead greyish white, with well-defined white eyebrow. Adult female resembles the male. The commonest species that passes through Amoy. Those collected on passage through Formosa are all immature, as if they had not strength to make the through voyage to the Philippines without rest. *L. schwaneri* of Borneo seems, from the description, to be based on a partially mature female of this species. Found in summer as far north as Talien Bay.

303. Lanius incertus, n. sp.

Crown, from beak to occiput, cinereous, with no eyebrow; rest of upper parts reddish brown, brighter on the rump. One male specimen procured at Amoy from a party of the last.

These four red-tailed Shrikes may be considered geographical races, or representative species, each reserving to itself an area in South-eastern Asia for its winter haunt, and another in North-eastern Asia for its summer haunt. The *L. cristatus*, that spreads throughout India in winter, seems to seek a family home in Dauria and the country directly north of India, extending to Trans-Baikal; *L. lucionensis* travels across the sea from its warm winter retreat in the Philippines, and spends its summer in North China, extending its range to Talien Bay; the southernmost species, *L. superciliosus*, comes from Malacca, and, passing the summer range of the latter, seeks the high latitudes of Amoorland and northern Japan as more suitable for the nurture of its offspring. As in the case of the *Limicolæ*, those that go furthest north to breed, hurry furthest south to escape the rigours of winter; such is, apparently, the case with *L. superciliosus*. But this is scarcely a rule with land-birds; for this Shrike's winter compatriot, *L. magnirostris*, as I have shown (P. Z. S. 1870, p. 131), is contented to accommodate himself at a halfway station on the journey in Central China. The route taken by *L. superciliosus* is not down the China coast, or we should meet him straggling down in spring and autumn, as all the migrants do that travel by land. He probably takes the more inland course followed by many birds that summer in North China and the Amoor. How, then, does it occasionally turn up with the large flights of *L. lucionensis* bound to the Philippines and Borneo? How, further, does it happen that *L. cristatus* should step out of its way and straggle on a tour to a country widely separate from its regular winter quarters? I would suggest as an explanation that the routes travelled by the three species must somewhere cross or touch, and that the outliers of the bird-caravans would get attracted to the allied throng with which they came into contact, and so pass on with it inadvertently. Thus it is matter of no great surprise that the typical *L. lucionensis* is occasionally obtained, as Mr. Blyth informs me, in Ceylon, whither it would have travelled with *L. cristatus*, or in the Tenasserim, whither the company of *L. superciliosus* would have conducted it. To account for this phenomenon I was before led to suppose that the variation of the three species was not constantly fixed, and that each race occasionally developed the peculiarities of either of the others. But my present hypothesis is, I think, the right one. There need be no confusion of races by the intercrossing of species, for the misguided birds would be among strangers only for the winter; in the summer, on their return journey, they would have the opportunity of rejoining their species.

Lanius incertus is founded on one male specimen, and, from its being so different in plumage, will, I think, be found to belong to another geographical race, with winter and summer resorts of its own, which has, in a similar way, been allured from its ordinary course of migration.

304. TEPHRODORNIS PELVICA (Hodgs.); Ibis, 1870, p. 241.

Tenthaca pelvica, Hodgs. Ind. Rev. 1837, p. 447.
Hainan.

305. ARTAMUS FUSCUS (Vieill.); Ibis, 1862, p. 306, 1870, p. 247; P. Z. S. 1863, p. 287.

Hainan. Macao (Cassin, *v.* Perry's Exp. to Japan).

306. DICRURUS CATHŒCUS, n. sp.

D. macrocercus, Swinh. Ibis, 1860, p. 59, 1861, pp. 43, 340, 1863, p. 266, 1865, p. 348, 1866, p. 121, 1870, p. 244; P. Z. S. 1862, p. 319, 1863, p. 285, 1870, p. 433.

The term *macrocercus* has been applied in India to two distinct species of Black Drongos,—the one a long bird, always distinguishable by a white spot close to the gape, the *D. albirictus* of Hodgson; and the other allied to our Chinese bird. The name was given by Vieillot to the Java bird of this group—the *Edolius longus*, Temm., and *E. forficatus*, Horsf. The Java species is smaller than the Indian bird, of more slender and elongated form, and has smaller feet. Our China bird, which is found throughout China, Hainan, and Formosa, is larger than its Indian ally, with longer bill and much longer wing, and has a rich bronze gloss over its feathers, including its wings and tail; wing 6 inches, tail 6. I propose to separate it specifically under the above name. Our Drongo, in its nestling plumage, is of a greyish black (which browns with wear), deeper on the upper parts, bronzed on its wings and tail, with white on its axillaries and carpal edge. In changing into the bronzed plumage of the adult, the feathers of the underparts appear with broad white margins, which gradually give place to uniform bronze. Young males often begin to acquire the adult plumage on leaving the nest.

307. **Buchanga mouhoti**, Walden, Ann. Mag. N. H. 4th ser. v. p. 220; Ibis, 1870, p. 245.

Hainan.

308. **Buchanga leucogenys**, Walden, Ann. Mag. N. H. 4th ser. v. p. 219; Ibis, 1870, p. 245.

Dicrurus cineraceus, Ibis, 1861, p. 265, 1862, p. 258.
Dicrurus cinerascens, Ibis, 1861, p. 411.
Dicrurus leucophæus, P. Z. S. 1863, p. 285.
Hainan to Foochow, and westward to Szechuen.

309. **Buchanga innexa**, Swinh. Ibis, 1870, p. 246.

Hainan.

310. **Chibia brevirostris**, Cab. Mus. Hein. i. p. 112.

Chibia hottentotta (L.); Ibis, 1861, p. 411, 1863, p. 96; P. Z. S. 1862, p. 319, 1863, p. 285.

Amoy; Tientsin; Pekin (*David*). Outer tail-feather very broad and much curled, bill rather shorter, bronzed spots on breast rounder, frontal deflected bristles long and coarse; otherwise very similar to *C. hottentotta* of India.

311. **Chaptia brauniana**, Swinh. Ibis, 1863, p. 269, 1866, p. 399.

Formosa.

312. **Graucalus rex-pineti**, Swinh. Ibis, 1863, p. 265, 1866, pp. 393, 402, 1870, p. 242.

Formosa; Hainan.

313. **Volvocivora melaschista**, Hodgs. Ind. Rev. 1837, p. 328; P. Z. S. 1863, p. 282.

Volvocivora lugubris, Sundev.
Campephaga cinerea?, Ibis, 1860, p. 58.
Campephaga ——?, Ibis, 1861, p. 42.
Canton to Foochow, and westwards to Szechuen. Summer visitant.

314. **Volvocivora saturata**, Swinh. Ibis, 1870, p. 242.

Hainan.

315. **Pericrocotus cinereus**, Lafresn. Rev. Zool. 1845, p. 94; Ibis, 1860, p. 58, 1861, p. 42, 340, 1862, p. 263, 1870, p. 244; P. Z. S. 1863, p. 283.

Ranges from the South to Pekin.

316. **Pericrocotus cantonensis**, Swinh. Ibis, 1861, p. 42, 1865, p. 107, 1870, p. 244; P. Z. S. 1863, p. 284.

Pericrocotus sordidus, Swinh. (immature), P. Z. S. 1863, p. 284.
Northwards to Foochow, and westwards to Szechuen.

317. Pericrocotus igneus, Blyth; J. Verreaux, Rev. et Mag. de Zool. (May 1867) p. 169.

Western China, Perny's collection (*J. Verr.*).

318. Pericrocotus brevirostris, Vig.; Gould, Cent. pl. 8.

Passes Pekin in migration, but does not breed in the Chelee province (*David*).

319. Pericrocotus griseigularis, Gould, P. Z. S. 1862, p. 282; B. of As. pl.; Ibis, 1863, p. 263, 1866, p. 399.

Formosa; Fokien province.

320. Pericrocotus speciosus (Lath.); Gould, Cent. pl. 7; Ibis, 1867, p. 403; P. Z. S. 1863, p. 285.

Pericrocotus brevirostris ?, Ibis, 1862, p. 257.
Fokien province.

321. Pericrocotus fraterculus, Swinh. Ibis, 1870, p. 244.

Hainan.

322. Butalis griseosticta, Ibis, 1866, p. 131, P. Z. S. 1863, p. 288.

Hemichelidon griseisticta, Swinh. Ibis, 1861, p. 330, 1863, p. 262.
Hemichelidon fuliginosa, Ibis, 1860, p. 57.
Butalis hypogrammica, G. R. Gray; Wallace, Ibis, 1862, p. 350.
China in summer, winters in the Moluccas.

323. Butalis sibirica (Gmel.); P. Z. S. 1863, p. 288, 1870, p. 440.

Muscicapa sibirica, Gmel. Syst. Nat. 1788, p. 936.
Muscicapa fuscedula, Pall. Zoogr. i. p. 462.
Hemichelidon fuliginosa, Hodgs.
Amoy; Pekin.

324. Butalis ferruginea (Hodgs.); Ibis, 1870, p. 247; P. Z. S. 1863, p. 288.

Hemichelidon rufilata, Swinh. Ibis, 1860, p. 57.
Hemichelidon ferruginea, Hodgs. Ibis, 1861, p. 40.
South China; Hainan.

325. Butalis latirostris (Raffles), P. Z. S. 1863, p. 288.

Hemichelidon latirostris, Ibis, 1860, p. 57, 1861, pp. 40, 330, 1863, p. 262.
Muscicapa latirostris, Raffles, Trans. Linn. Soc. xiii. pt. 2 (1822), p. 312.
Muscicapa cinereoalba, Temm. & Schleg. Faun. Jap.; Ibis, 1870, p. 247.
Muscicapa grisola, var. *daurica*, Pall. Zoogr. i. p. 461.
Summers in China.

326. ERYTHROSTERNA ALBICILLA (Pall.); P. Z. S. 1862, p. 317.

Muscicapa albicilla, Pall. Zoogr. i. p. 462.

Erythrosterna leucura (Gmel.); Ibis, 1860, p. 357, 1863, p. 92, 1870, p. 247; P. Z. S. 1863, p. 290.

Erythrosterna mugimaki, Ibis, 1861, p. 330.

Thamnobia niveiventris, Swinh. Ibis, 1860, p. 54.

Winters in Southern China. Gmelin's *Muscicapa leucura* (Syst. Nat. i. 1788, p. 939) is from the Cape of Good Hope, and therefore cannot be our bird.

327. ERYTHROSTERNA LUTEOLA (Pall.); Midd. Sib. Reis. pl. xvii. (winter plumage); Ibis, 1866, p. 313; P. Z. S. 1863, p. 290.

Motacilla luteola, Pall.; Zoogr. i. p. 470.

Muscicapa mugimaki, T. & S. Faun. Jap. (adult ♂ in summer); Ibis, 1860, p. 357, 1867, p. 390, 1870, p. 247.

Muscicapa hylocharis, Swinh. Ibis, 1862, p. 305 (young ♂).

China coast and Formosa in autumn. Wanders down to Penang (*E. erythaca*, Blyth).

328. MUSCICAPULA SAPPHIRA (Tick.); Jerd. Ind. Orn. pl. 32.

Western China (Perny's coll., Rev. et Mag. de Zool. 1867, p. 169).

329. XANTHOPYGIA NARCISSINA (Temm.) Pl. Col. 577; Swinh. Ibis, 1860, p. 58, 1861, pp. 41, 410, 1870, p. 247; P. Z. S. 1863, p. 289.

Passes up and down the China coast. Summers in Japan.

330. XANTHOPYGIA TRICOLOR (Hartl.).

Xanthopygia leucophrys, Blyth, Ibis, 1861, p. 410, 1863, p. 92; P. Z. S. 1862, p. 317, 1863, p. 289.

Rare on the coast. Breeds near Pekin (*David*). Found in winter in Malacca.

331. NILTAVA SUNDARA, Hodgs. Ind. Rev. 1837, p. 650; Gould, B. of As. pl.

Western China (Perny's collection, identified by J. Verreaux).

332. CYORNIS VIVIDA, Swinh. Ibis, 1864, p. 363, 1866, p. 393, pl. 11.

Formosa. The male is a mimicry of the last; the female, a true *Cyornis*, without the blue spot on the side of the neck that distinguishes females of the *Niltava* group.

333. CYANOPTILA CYANOMELÆNA (Temm.) Pl. Col. 470; Ibis, 1870, p. 247.

Muscicapa gularis, T. & Schleg. F. J. (♀).

Niltava cyanomelæna, Ibis, 1860, p. 58, 1861, p. 41, 1863, p. 92; P. Z. S. 1862, p. 317, 1863, p. 290.

Hypothymis cyanomelæna, Ibis, 1862, p. 306.

Passes up and down the China coast. Summers in Japan.

334. STOPAROLA MELANOPS (Vig.); Gould, Cent. pl. 6; Ibis, 1861, p. 263.

Eumyias melanops, P. Z. S. 1863, p. 289.
Amoy; Western China (*Perny* and *David*).

335. SIPHIA STROPHIATA, Hodgs. Ind. Rev. 1837, p. 651.

Moupin, from Père David. The Paris Museum has received another species from the same locality allied to *S. erithacus*, Blyth, from Darjeeling.

336. DIGENIA SUPERCILIARIS (Blyth, J. A. S. xi. p. 190); P. Z. S. 1845, p. 26.

Siphia innexa, Swinh. Ibis, 1866, p. 394.
Siphia rubrocyanea, Hodgs.

Formosa. Known also from the Himalayas; and from Timor as *Muscicapa tricolor* ♂ (*rupestris* ♀), Müll.: see Blyth, Ibis, 1865, p. 44.

337. MYIAGRA AZUREA (Bodd.), Pl. En. 666; Ibis, 1861, p. 263, 1863, p. 261, 1865, p. 545, 1870, p. 247; P. Z. S. 1863, p. 289.

Tchitrea cæruleocephala ?, Ibis, 1860, p. 57.

Formosa; Hainan; Amoy (one specimen).

338. CULICICAPA CINEREOCAPILLA (Vieill.); Sw. Zool. Ill. pl. 13.

Szechuen province, in the gorges of the Yangtsze river. The former generic name of this species (*Cryptolopha*) having been preoccupied, I propose to apply to it the above term.

339. TCHITREA PRINCEPS (Temm. Pl. Col. 584).

Tch. principalis, Ibis, 1860, p. 57, 1861, pp. 39, 411, 1863, p. 260, 1865, p. 541; P. Z. S. 1863, p. 289.

Passes the South-China coast. Summers in Japan.

340. TCHITREA INCEI, Gould, B. of As. pl.; Ibis, 1863, p. 92; P. Z. S. 1862, p. 317, 1863, p. 289, 1870, p. 439.

T. principalis, Ibis, 1861, p. 330, 1866, p. 297.

Summers in Central and North China.

341. GARRULUS SINENSIS, Gould, P. Z. S. 1863, p. 304.

G. ornatus, Ibis, 1861, p. 267, 1862, pp. 261, 263.

South China, westwards to Szechuen. Chinese specimens have longer legs and feet than the Himalayan *G. bispecularis*, Vigors; but I can detect no other difference.

342. GARRULUS TAIVANUS, Gould; P. Z. S. 1862, p. 282; B. of As. pt. xvi.; Ibis, 1863, p. 386.

Formosa.

343. GARRULUS BRANDTI, Eversm. Addend. ad Pall. Zoogr. Rosso-Asiat. 1843, iii. p. 8.

North China; Pekin.

344. UROCISSA SINENSIS (L.); Ibis, 1861, pp. 43, 267, 409, 1862, p. 261, 1865, p. 349, 1867, p. 407; P. Z. S. 1863, p. 304, 1870, p. 448.

Cuculus sinensis, Gmel. Syst. Nat. i. (1788) p. 418.
Corvus erythrorhynchus, Gmel. p. 372.
Throughout China.

345. UROCISSA CÆRULEA, Gould; P. Z. S. 1862, p. 282; B. of As. pl.; Ibis, 1863, p. 384, 1866, pp. 121, 296, 303.

Formosa.

346. DENDROCITTA SINENSIS (Lath.); Ibis, 1868, p. 62, 1870, p. 351; P. Z. S. 1863, p. 304.

Corvus sinensis, Lath. Ind. Orn. i. p. 161.
South China; Hainan.

347. DENDROCITTA FORMOSÆ, Swinhoe.

Dendrocitta sinensis, var. *formosæ*, Ibis, 1863, p. 387, 1865, p. 234, 1866, pp. 296, 394.
Formosa.

348. NUCIFRAGA CARYOCATACTES (L.); P. Z. S. 1863, p. 306, 1870, p. 448.

Pekin.

349. NUCIFRAGA HEMISPILA, Vig.; Gould, C. B. pl. 36.

Sent from Moupin by Père David.

350. PICA MEDIA, Blyth, J. A. S. xiii. (1844), p. 393; Ibis, 1863, p. 383, 1870, p. 350.

Pica sericea, Gould, P. Z. S. 1845, p. 2; Ibis, 1860, pp. 60, 429, 1861, pp. 43, 336, 1867, p. 236.
Pica caudata, P. Z. S. 1863, p. 303.

Throughout China; Formosa; Hainan. Birds from Pekin and Kalgan are much more brightly coloured than southern examples.

351. CYANOPOLIUS CYANUS.

Corvus cyanus, Pall. Zoogr. R. A. i. p. 391.
Cyanopica cyana, Ibis, 1861, p. 336; P. Z. S. 1863, p. 304.
Shanghai to Pekin, and westwards to Ichang (Hoopih province).

352. CORVUS JAPONENSIS, Bp. Consp. Av. p. 386.

Corvus macrorhynchus, Schleg. Faun. Jap. t. 39.
Beyond the Great Wall.

353. CORVUS SINENSIS, Gould; Moore, Cat. Birds E. I. Co. ii. p. 556; Ibis, 1862, p. 260, 1863, pp. 95, 383, 1870, p. 348; P. Z. S. 1863, p. 305.

Corvus colonorum, Swinh. Ibis, 1864, p. 427, 1866, pp. 296, 402.
Corvus japonicus, Ibis, 1861, p. 337.
Corvus japonensis, Ibis, 1862, p. 260.
Throughout China; Formosa; Hainan.

354. CORVUS TORQUATUS, Lesson, Traité d'Ornith. p. 328; P. Z. S. 1863, p. 305.

Corvus pectoralis, Gould, Ibis, 1860, p. 60, 1861, pp. 43, 337, 1862, p. 260, 1867, p. 411, 1870, p. 350.

355. CORVUS CORONE (L.); Ibis, 1870, pp. 79, 348.

Naochow Island, near Hainan.

356. FRUGILEGUS PASTINATOR.

Corvus pastinator, Gould, P. Z. S. 1845, p. 1; Ibis, 1861, p. 336; P. Z. S. 1863, p. 305.
Ningpo to Pekin.

357. LYCOS DAURICUS (Pall. Zoogr. t. 15); P. Z. S. 1863, p. 304.

Corvus dauricus, Ibis, 1861, pp. 257, 337.

Ningpo to Pekin. I cannot understand Prof. Schlegel (Mus. des Pays-Bas) considering the following species the young of this bird. I have taken this bird from the nest, and found the young beginning life with all the pied characters of the adult.

358. LYCOS NEGLECTUS (Schleg. F. J. t. 40); P. Z. S. 1863, p. 305.

Corvus neglectus, Ibis, 1861, pp. 259, 337, 1867, p. 227.

Ningpo to Pekin. This species is closely related to *L. monedula*, but has a much smaller and slenderer bill, and no grey on the sides of the head and neck. I have procured at Shanghai a hybrid between this and the last.

359. FREGILUS GRACULUS (L.), var. BRACHYPUS.

Fregilus graculus, Ibis, 1863, p. 95; P. Z. S. 1862, p. 319, 1863, p. 306, 1870, pp. 434, 444.

Pekin. The Himalayan bird has much longer feet than ours, and scarcely any purple gloss on the body-plumage. Ours differs also from the European species by its tarsi being a good deal shorter and its toes quite stumpy. A bird from Siberia in the Cambridge Museum agrees with the Chinese bird.

360. EULABES SINENSIS, Swinh. Ibis, 1870, p. 353.

South-west China.

361. EULABES HAINANUS, Ibis, 1870, p. 352.

Gracula, sp., Ibis, 1860, p. 361.
Hainan.

362. ACRIDOTHERES CRISTATELLUS (L.); Ibis, 1860, pp. 60, 429, 1861, p. 44, 1862, p. 260, 1863, p. 382; P. Z. S. 1863, p. 302.

Gracula cristatella, Gmel. Syst. Nat. 1788, p. 397.
Acridotheres philippensis, Ibis, 1867, p. 387, 1870, p. 352.
South China to Shanghai, and westwards to Szechuen; Hainan; Formosa.

363. GRACUPICA NIGRICOLLIS (Payk.); Act. Holm. xxviii. t. 9; Ibis, 1860, p. 60, 1861, pp. 44, 260; P. Z. S. 1863, p. 303.

Pastor bicolor, Gray, Zool. Misc. p. 1.
Canton to Foochow.

364. TEMENUCHUS SINENSIS (Gmel.); Ibis, 1866, p. 394, 1870, p. 352.

Temenuchus turdiformis (Wagler); Ibis, 1860, p. 60, 1861, p. 44.
Heterornis sinensis, Ibis, 1863, p. 382, 1865, p. 358, 1866, p. 138; P. Z. S. 1863, p. 302.

Summers in South China from Canton to Foochow. Observed as a migrant in Formosa and Hainan. Winters in Pegu.

365. TEMENUCHUS DAURICUS (Pall. Act. Stockh. 1778, iii. p. 198); Pl. Enl. 627. 3; Ibis, 1863, p. 95; P. Z. S. 1863, p. 302.

Gracula sturnina (Pall.); Gmel. Syst. Nat. 1788, p. 399.
Sturnus pyrrhogenys, Ibis, 1861, p. 338.
Sturnus dauricus, Ibis, 1866, p. 131; P. Z. S. 1862, p. 319.

Procured at Tientsin and Pekin; would appear to summer in North-east Tartary, and to winter in Malacca and Java.

366. STURNUS CINERACEUS, Temm. Pl. Col. 556; Ibis, 1861, pp. 257, 338, 1863, p. 382, 1870, p. 352; P. Z. S. 1862, p. 319, 1863, p. 301.

Temenuchus cineraceus (Temm.); Ibis, 1860, p. 60, 1861, p. 44.

Passes down the coast in winter. Breeds in North China. Found during winter in Formosa and Hainan.

367. STURNUS SERICEUS, Gmel. Syst. Nat. 1788, p. 805; Ibis, 1861, p. 338; P. Z. S. 1863, p. 301.

Pastor sericeus, Gray, Zool. Misc. p. 1.
Temenuchus sericeus (Lath.); Ibis, 1860, p. 60, 1861, p. 44.
Sturnus cinereus, Ibis, 1862, p. 306.
Fokien and Canton provinces.

368. MUNIA SINENSIS (Briss.).

Coccothraustes sinensis, Briss. Orn. iii. p. 238.

Munia rubronigra, Hodgs. Ibis, 1861, p. 45; Blyth, Ibis, 1860, p. 61.
South-west China.

369. MUNIA FORMOSANA, Swinh. Ibis, 1865, p. 356.

Formosa.

370. MUNIA TOPELA, Swinh. Ibis, 1863, p. 380, 1870, p. 354; P. Z. S. 1863, p. 299.

Munia malacca, Ibis, 1860, p. 61, 1861, p. 45.
South China; Hainan; Formosa.

371. MUNIA ACUTICAUDA, Hodgs. As. Res. xix. (1836) p. 153; Ibis, 1863, p. 379, 1870, p. 354; P. Z. S. 1863, p. 299.

Munia molucca, Ibis, 1860, p. 61.
Munia minima?, Ibis, 1860, p. 358, 1861, p. 45.
Hainan to Shanghai, and westwards to Szechuen; Formosa.

372. PADDA ORYZIVORA (Linn.).

Oryzornis oryzivora, Ibis, 1860, p. 60.
Munia oryzivora, Ibis, 1861, p. 45; P. Z. S. 1863, p. 299.
Hongkong; Amoy; Shanghai.

373. FRINGILLA MONTIFRINGILLA, L.; Ibis, 1861, p. 335, 1864, p. 423; P. Z. S. 1862, p. 318, 1863, p. 298.

North China in winter. Occurs occasionally as far south as Amoy.

374. CHRYSOMITRIS SPINUS (L.); Ibis, 1861, p. 267; P. Z. S. 1863, p. 299, 1870, p. 433.

Fringilla spinus, Ibis, 1861, p. 335.
Pekin in autumn, and in winter down to Foochow.

375. CHLOROSPIZA SINICA (L.); P. Z. S. 1863, p. 299, 1870, p. 433.

Ligurinus sinicus, Ibis, 1860, p. 61, 1861, p. 45.
Fringilla sinica, Ibis, 1861, p. 335, 1863, p. 378.
Canton to Pekin, and westwards to Ichang (Hoopih Province).

376. PYRGITA PETRONIA (L.).

Breeds in the Ordo Mountains, north-west of Pekin (*David*). Père David, in his Catalogue, mentions an allied Finch which he has procured on the most elevated regions of Mongolia. This novelty will shortly be described by J. Verreaux.

377. LEUCOSTICTE BRUNNEINUCHA (Brandt).

Seen in North Chelee in the coldest weather (*David*).

378. FRINGILLAUDA NEMORICOLA, Hodgs. As. Res. xix. (1836) p. 158; Bp. Lox. t. 47.

Sent from Moupin by Père David.

379. Ægiothus borealis (Temm.).

Ægiothus canescens, Gould; P. Z. S. 1863, p. 299.
Cannabina canescens, Ibis, 1861, p. 335.
Winters in North China.

380. Passer montanus (L.); Ibis, 1860, p. 60, 1861, pp. 45, 255, 1863, p. 378, 1870, p. 354; P. Z. S. 1863, p. 299, 1870, p. 433.

Fringilla montana, Ibis, 1861, p. 335, 1862, pp. 258, 260.
The House-Sparrow of all China, Hainan, and Formosa.

381. Passer rutilans, Temm. Pl. Col. 288.

Passer russatus, Schleg. Faun. Jap.; Ibis, 1861, p. 45, 1863, p. 378, 1866, p. 295; P. Z. S. 1863, p. 299.
South China and Formosa.

382. Passer cinnamomeus (Gould).

Pyrgita cinnamomea, Gould, P. Z. S. 1835, p. 185.
Occurs at Ichang, and westwards to Szechuen.

383. Passer ouratensis, David, in Mus. Pekin; Swinh. P. Z. S. 1870, p. 430.

Ordo Mountains (*David*).

384. Coccothraustes vulgaris, var. japonicus, Ibis, 1861, p. 336; P. Z. S. 1863, p. 299, 1870, p. 448.

Coccothraustes vulgaris japonicus, T. & S. Faun. Jap.
Shanghai to Pekin, and westwards to the Ichang gorge.

385. Eophona melanura (Gmel.); Gould B. of As. pl.; Ibis, 1867, p. 390.

Coccothraustes melanurus, Ibis, 1860, p. 61, 1861, p. 45; P. Z. S. 1863, p. 299.
Loxia melanura, Gmel. Syst. Nat. i. p. 853.
Throughout China.

386. Eophona personata, Schleg. F. J. t. 52; P. Z. S. 1870, p. 448.

Pekin.

387. Mycerobas melanoxanthus, Hodgs.

Coccosthraustes melanoxanthus, Hodgs. As. Res. xix. (1836) p. 150.
Sent from Moupin by Père David.

388. Pyrrhula griseiventris, Lafr.

Pyrrhula orientalis, Temm. F. J. t. 58.
From Shanghai northwards.

389. Pyrrhula erythrocephala, Vig. P. Z. S. 1831, p. 174; Gould, C. B. pl. 32.

Sent from Moupin by Père David.

390. Carpodacus erythrinus (Pall. Zoogr. t. 36); Ibis, 1863, p. 95; P. Z. S. 1862, p. 318, 1863, p. 299.

Visits China in winter.

391. Carpodacus davidianus, M.-Edw. N. Arch. du Mus. i. t. 2, 3.

Breeds on the highest mountains near Pekin (*David*).

392. Carpodacus mongolicus, Swinh. P. Z. S. 1870, p. 447.

On the western hills near Pekin. Resident in Ordo (*David*). The Paris Museum has received three other species of this group from Moupin, which appear to be new. One of them has been wrongly referred to *Pyrrha saturata*, Bp.

393. Uragus sibiricus (Pall.)

Loxia sibirica, Pall. Itin. ii. Append. p. 711.

One specimen procured by Père David at Pekin.

394. Loxia albiventris, Swinh. P. Z. S. 1870, p. 437.

Loxia curvirostra (L.), Ibis, 1861, p. 336; P. Z. S. 1863, p. 299.

Pekin.

395. Loxia himalayana, Hodgs.; Gray's Zool. Misc. 1844, p. 85.

Sent by Père David from Moupin.

396. Melophus melanicterus (Gmel.); P. Z. S. 1863, p. 300.

Fringilla melanictera, Gmel. S. N. i. p. 910.
Emberiza lathami, Gray, Zool. Misc. p. 1.
Melophus lathami, Ibis, 1860, p. 62, 1861, p. 46, 1867, p. 233.
South China.

397. Euspiza aureola (Pall. It. ii. p. 711); Ibis, 1860, p. 62, 1861, pp. 45, 334; P. Z. S. 1863, p. 300.

Emberiza aureola, Ibis, 1863, p. 378, 1870, p. 354.
China generally.

398. Euspiza rutila, Pall. It. iii. p. 698; P. Z. S. 1863, p. 300.

Emberiza rutila, Ibis, 1861, pp. 334, 410; P. Z. S. 1862, p. 318.
Emberiza sinensis, Gmel. Syst. Nat. 1788, i. p. 869.
North China, wandering south in winter.

399. EUSPIZA SULPHURATA (Temm. & Schleg.) Faun. Jap. t. 60; Ibis, 1860, p. 359, 1861, pp. 46, 334; P. Z. S. 1863, p. 300.

Emberiza sulphurata, Ibis, 1863, p. 378.
South China and Formosa in winter.

400. EMBERIZA FUCATA, Pall. It. iii. p. 698; Faun. Jap. t. 57; Ibis, 1860, p. 61, 1861, pp. 45, 324, 1863, p. 378, 1870, p. 354; P. Z. S. 1863, p. 301.

South China in winter.

401. EMBERIZA RUSTICA, Pall. It. iii. p. 698; P. Z. S. 1863, p. 301.

North China.

402. EMBERIZA SPODOCEPHALA, Pall. It. iii. p. 698; Ibis, 1863, p. 377, 1870, p. 354; P. Z. S. 1863, p. 300.

Emberiza personata, Temm. Pl. Col. 580; Ibis, 1861, pp. 45, 334, 1862, p. 258.
Euspiza personata, Ibis, 1860, p. 62.
South China and Formosa in winter.

403. EMBERIZA ELEGANS, Temm. Pl. Col. 583.

North China and Moupin.

404. EMBERIZA ELEGANTULA, Swinh. P. Z. S. 1870, p. 134.

Ichang gorge (Hoopih province).

405. EMBERIZA CHRYSOPHRYS, Pall. It. iii. p. 698; P. Z. S. 1863, p. 301.

North China; Szechuen.

406. EMBERIZA LEUCOCEPHALA, S. G. Gmel. Nov. Comm. Petrop. xv. p. 480.

Emberiza pithyornus, Pall. It. ii. p. 710; Ibis, 1863, p. 95; P. Z. S. 1863, p. 300.
Emberiza ——?, Ibis, 1861, p. 334.
Pekin.

407. EMBERIZA CIOPSIS, Bp.; P. Z. S. 1863, p. 300.

Emberiza cioides, Temm. & Schleg. Faun. Jap. t. 59; Ibis, 1861, pp. 409, 410, 1863, p. 378; P. Z. S. 1870, p. 436.
Emberiza rustica, Ibis, 1861, p. 255, 1863, p. 87.
Emberiza gigliolii, Swinh. Ibis, 1867, p. 393.
South China in winter.

408. EMBERIZA TRISTRAMI, Swinh. P. Z. S. 1870, p. 441.

Emberiza stracheyi, Ibis, 1863, p. 95; P. Z. S. 1862, p. 318, 1863, p. 301.
Tientsin. Fokien in winter.

409. EMBERIZA CASTANEICEPS, Gould; Moore, P. Z. S. 1855, p. 215.

Pekin. "Resident in the Pekin mountains and in Mongolia" (*David*).

410. EMBERIZA PUSILLA, Pall. It. iii. p. 697; Ibis, 1860, p. 61, 1861, p. 334; P. Z. S. 1863, p. 301.

North China; spreads south in winter.

411. SCHŒNICOLA PALLASII, Cab.

Emberiza schœniclus, var. *minor*, Midd. Sib. Reis. Vög. p. 144.
Emberiza canescens, Swinh. Ibis, 1860, p. 62, 1861, p. 334; P. Z. S. 1863, p. 301.
Amoy in winter. River Yangtsze.

412. PLECTROPHANES NIVALIS (L.); P. Z. S. 1863, p. 301.

North China in the coldest seasons.

413. PLECTROPHANES LAPPONICUS (L.); Ibis, 1861, p. 334; P. Z. S. 1863, p. 301.

Common at Pekin in winter.

414. ALAUDA ARVENSIS, L.; Ibis, 1863, p. 94; P. Z. S. 1863, p. 271.

Alauda pekinensis, P. Z. S. 1863, p. 89.
Alauda japonica, Ibis, 1861, p. 333.
"Arrives in Pekin and leaves again in April; some individuals spend the summer in our plains. The Skylark, though known here and at Senen-hwa-foo, is not known in high Mongolia, where it is replaced by *Otocoris* and *Calandrella*" (*David*).

415. ALAUDA CANTARELLA, Bp.; P. Z. S. 1863, p. 271.

Alauda intermedia, Swinh. P. Z. S. 1863, p. 89.
Shanghai.

416. ALAUDA CŒLIVOX, Swinh. Zoologist, 1859, p. 6723; Ibis, 1860, p. 62, et pp. 132, 429, 1861, p. 46, 1867, p. 227, 1870, p. 354; P. Z. S. 1863, pp. 89, 272.

Amoy; Canton; Hainan.

417. ALAUDA SALA, Swinh. Ibis, 1870, p. 354.

Alauda cœlivox (in part), Ibis, 1863, p. 377.
North Formosa; West Hainan.

418. ALAUDA WATTERSI, n. sp.

Alauda cœlivox (in part), Ibis, 1863, p. 377.
Distinguishable from *A. cœlivox* by its shorter and more conical bill, by its long hind claw, by its large and more numerous pectoral spots, and by its want of rufescence. By its long hind claw and markings it comes nearer to *A. sala*; but the long curved bill of

the latter serves at once to separate it. It is the Skylark of South Formosa and the Pescadores.

419. GALERIDA CRISTATA (L.).

Galerida leautungensis, Swinh.; P. Z. S. 1863, p. 272, 1870, p. 133.
Alauda leautungensis, Ibis, 1861, p. 256, 1863, p. 87.
Talienwan and Pekin valleys.

"Resident and common at the feet of our mountains and in Mongolia" (*David*).

420. ALAUDULA CHELEËNSIS, n. sp.

Alauda brachydactyla, Swinh.; Ibis, 1861, pp. 255, 333.
Calandrella pispoletta, P. Z. S. 1863, p. 271.

Differs from *A. pispoletta*, from the banks of the Volga, in being smaller in all its proportions, in having a more pyrrhuline bill, in its more rufescent plumage, and in having its outer tail-feathers almost entirely white.

Talien Bay. "Not rare at Pekin, but particularly abundant in Mongolia" (*David*).

421. CALANDRELLA BRACHYDACTYLA (Leisl.)?

A short-toed Lark with unspotted breast has been received at the Paris Museum from Moupin, which looks like the Indian bird. The second species at Pekin mentioned by Père David in his Catalogue may also possibly be this species.

422. MELANOCORYPHA MONGOLICA (Pall.); Ibis, 1861, p. 333, 1867, p. 232; P. Z. S. 1863, p. 271.

Pekin plains in winter; very common in Mongolia (*David*).

423. OTOCORYS ALPESTRIS (L.).

The Alpine Lark with the yellow throat only comes to the northern parts of the Chelee Province during the great cold (*David*). It has been sent from Trans-Baikal.

424. OTOCORYS SIBIRICA, Eversm.

Otocoris alpestris, Swinh. P. Z. S. 1863, p. 272.
Otocoris penicillata, Ibis, 1863, p. 95; P. Z. S. 1862, p. 318.

Differs from the last in having a white face, and in being of a paler rosier hue above. "Sedentary and very abundant in the high regions of Mongolia, whence it descends to Pekin in small numbers. This pretty Lark loves the neighbourhood of Mongol tents in winter; but deserts them in the warm season. It rests on the bare hills, and sings more melodiously than even the Skylark." (*David.*)

425. PALÆORNIS LATHAMI, Finsch, Papageien, ii. p. 66.

Palæornis ——?, Ibis, 1867, p. 389.
Palæornis javanicus, Ibis, 1870, p. 93.
Hainan.

426. **Palæornis rosa** (Bodd.); Ibis, 1861, p. 411; P. Z. S. 1863, p. 259.

Canton. Our bird agrees with Burmese examples, and differs from the allied *P. cyanocephalus*, L. (*Ps. bengalensis*, Brisson), of Bengal. The latter can easily be distinguished by the long white tips to its central tail-feathers, by its brighter-coloured head, its verditer-green nape, and yellow back and underparts.

427. **Palæornis longicauda** (Bodd.).

Birds of this species are sold at Canton, and said to come from South-west China.

A fourth species, with a grey head (perhaps *P. schisticeps*, Hodgs.), is brought down the Upper Yangtsze; but, as I lost my only specimen, I have not been able to determine it. It was about the size of *P. alexandri*, with smaller bill, general colour green with grey cheeks, black mandibles, and a black moustache-streak.

428. **Loriculus puniculus**, Bp.

Brought by Mr. Fortune from Canton.

429. **Megalæma virens** (Bodd.); Ibis, 1861, p. 411; P. Z. S. 1863, p. 269.

Bucco grandis, Gmel. S. N. i. p. 408.

Fokien and Canton provinces. Differs from the large Barbet of the Himalayas, with which it has long been confounded, and which I have lately separated as *M. marshallorum* (Ann. & Mag. Nat. Hist. 4th ser. vi. p. 348).

430. **Megalæma nuchalis**, Gould, P. Z. S. 1862, p. 283; B. of As. pt. xvi.; Ibis, 1863, p. 387, 1865, p. 545, 1866, p. 296.

Formosa.

431. **Megalæma faber**, Swinh. Ibis, 1870, pl. 4, p. 96.

Hainan.

432. **Picus mandarinus**, Gould, P.Z.S. 1863, pp. 88, 268; Ibis, 1870, p. 94.

Picus major?, Ibis, 1861, p. 46, 1863, p. 96; P. Z. S. 1862, p. 319.

Picus cabanisi, Ibis, 1861, pp. 267, 339.

Hainan to Pekin and westwards to Szechuen. The white markings vary much in size and distribution, and the white feathers get stained to brown, but wash white again on the application of soap and water.

433. **Picus majoroides**, Hodgs.; Gray's Zool. Misc. 1844, p. 85.

Sent by Père David from Moupin, together with a new species of the same type, and another new species allied to *Picoides tridactylus* (L.).

434. Picus insularis, Gould, P. Z. S. 1862, p. 283; B. of As. pl.; Ibis, 1863, p. 390.

Formosa.

435. Picus pernyii, J. Verreaux, Rev. et Mag. de Zool. 1867, p. 271.

"Nearly the size of *P. cathpharius*, Hodgs.; to be distinguished by the whitish which covers the neck, by the black line which, in reaching the breast, spreads on the belly, and above all by the red patch on the thorax, of which there is no trace in Hodgson's species." (*J. Verreaux.*)

Western China (*Perny* and *David*).

436. Yungipicus scintilliceps (Swinh.).

Picus scintilliceps, Swinhoe, Ibis, 1863, p. 96; P. Z. S. 1863, p. 268.
Picus canifrons, Sundevall, Consp. Av. Picin. (1866), p. 26.
Picus ——?, Ibis, 1861, p. 340.
Pekin.

437. Yungipicus kaleënsis (Swinh.).

Picus kaleënsis, Swinh. Ibis, 1863, p. 390, 1866, pp. 134, 137, 1870, p. 95.
Dendrotypes nesiotes, Cab. & Heine, Mus. Hein. Heft ii. p. 49.
Formosa; Hainan; South China to Ningpo and westward to Ichang.

438. Hypopicus poliopsis.

Picus hyperythrus, P. Z. S. 1862, p. 319.
Picus hyperythrus, var. *poliopsis*, Swinh. P. Z. S. 1863, p. 268.
Picus poliopsis, Swinh. P. Z. S. 1870, p. 440.
Picus ——?, Ibis, 1861, p. 339, 1863, p. 96.
Xylurgus subrufinus, Cab. & Heine, Mus. Hein. v. p. 50.
Pekin.

439. Dryocopus martius (L.); P. Z. S. 1870, p. 442.

Pekin.

440. Gecinus canus (Gmel.); Ibis, 1861, p. 338; P. Z. S. 1862, p. 319, 1863, p. 267.

Pekin.

441. Gecinus guerini, Malh. Pic. t. 80. 4, 5; P. Z. S. 1863, p. 268.

Along the Yangtsze to Szechuen.

442. Gecinus tancola, Gould, P. Z. S. 1862, p. 283, 1863, p. 268; B. of As. pl.; Ibis, 1863, p. 389.

Gecinus ——?, Ibis, 1861, p. 267.
Formosa; Fokien province.

443. MICROPTERNUS FOKIENSIS (Swinh.), P. Z. S. 1863, p. 267.

Brachypternus bodius, Ibis, 1861, pp. 267, 409.
Brachypternus fokiensis, P. Z. S. 1863, p. 87; Ibis, 1867, p. 63.
Fokien province.

444. MICROPTERNUS HOLROYDI, Swinh. Ibis, 1870, p. 95.

Hainan.

445. YUNX JAPONICA, Bp. Consp. Av. p. 112.

Yunx torquilla, L.; Ibis, 1860, p. 62, 1861, p. 338, 1862, p. 260; P. Z. S. 1862, p. 319, 1863, p. 267.

Down the China coast in winter. Smaller than the European bird, but otherwise alike.

446. ZANCLOSTOMUS TRISTIS (Less.); Bélang. Voy. t. i.; Ibis, 1870, p. 234.

Melias tristis, Less. Tr. d'Orn. 1831, p. 132.
Hainan.

447. CENTROPUS SINENSIS (Steph.); Ibis, 1861, p. 49.

Centropus rufipennis (Illig.); Ibis, 1870, p. 234; P. Z. S. 1863, p. 266.

Polophilus sinensis, Ibis, 1861, p. 267.

South China, northwards to Wanchow, and in Hainan. I can find no distinctive characters between the Chinese and Bengalese specimens; but birds from Siam have the back chestnut as well as the scapulars, = *C. eurycercus*, A. Hay. The Java bird is coloured like ours, but is of larger size, and has a much larger bill, = *C. rufipennis*, Illig. (*bubutus*, Horsf.).

448. CENTROPUS BENGALENSIS (Gmel.).

Cuculus bengalensis, Gmel. Syst. Nat. 1788, i. p. 412.
Cuculus, sp., Ibis, 1860, p. 359, 1861, p. 48.
Cuculus dimidiatus?, Ibis, 1860, p. 360.
Cuculus viridis, Ibis, 1863, p. 392, 1870, p. 235; P. Z. S. 1863, p. 266.

South China, Hainan, and Formosa. Birds from the same locality extremely variable in size. Our birds agree with specimens from Bengal, Malacca, Java, and some of the isles. From Timor I have seen a larger species, the *C. moluccensis*, Bernst. (*medius*, G. R. Gr.), which by its similar immature plumage is connected with the present species, but in size almost approaches the foregoing. The second or streaked plumage of the *C. bengalensis* is peculiar for the enormous length of the upper tail-coverts, which nearly cover the surface of the tail to its end. In the first or nestling plumage, and in the adult or rufous-and-black plumage, these coverts are short. In this intermediate dress it is recognized as the *C. lepidus* of Horsfield.

449. EUDYNAMIS MACULATA (Gmel.).

Cuculus maculatus, Gmel. Syst. Nat. 1788, i. p. 415.

Eudynamis orientalis, Ibis, 1861, p. 46, 1866, p. 131, 1867, p. 59; P. Z. S. 1863, p. 264.

Summers and breeds about Canton; occurs occasionally as high as Amoy.

450. EUDYNAMIS MALAYANA, Cab. & Heine; Swinh. Ibis, 1870, p. 231.

Plentiful in Hainan.

451. COCCYSTES COROMANDUS (L.).

Cuculus coromandus, Linn. S. N. i. p. 171.

Coccystes coromandus, var. *fuliginiventer*, Ibis, 1867, p. 227.

Amoy. A specimen from Malacca has the abdomen nearly as dusky as the bird procured at Amoy.

452. SURNICULUS DICRUROIDES (Hodgs.).

Pseudornis dicruroides, Hodgs.; J. A. S. Beng. viii. 1839, p. 136.

Procured by me near Chungkingfoo, in Szechuen, in May.

453. CACOMANTIS TENUIROSTRIS (J. E. Gray), Ind. Zool. ii. 1833, t. 34, f. 1.

Polyphasia tenuirostris, Ibis, 1870, p. 230; P. Z. S. 1863, p. 266.

Cuculus tenuirostris, Swinh. Ibis, 1860, p. 62, 1861, p. 46.

Comes to South China to breed; occurred also in Hainan. Chinese specimens appear to agree with some procured in the neighbourhood of Calcutta; and Lord Walden identifies it with the Burmese species.

454. CHRYSOCOCCYX HODGSONI, Moore, Cat. Birds Mus. E.I.C. ii. p. 705; Jerd. B. of Ind. i. p. 338.

Lampromorpha plagosus, Bp. Rev. et Mag. de Zool. (Mai 1867) pp. 169, 173.

Forwarded by Monseigneur Perny to the Paris Museum from Western China.

455. CUCULUS SPARVEROIDES, Vigors, P. Z. S. 1831, p. 173; Gould, C. of B. pl. 53; V. Schrenck, Amur-Land, i. p. 24, t. 10.

Hierococcyx fugax, Swinh. P. Z. S. 1863, p. 265.

Very common in spring in the hilly region of the Upper Yangtsze, as far west as Moupin. Has occurred also in Amoorland. A noisy bird, crying loudly from the tops of trees, often during the night. Its note resembles somewhat that of the Koel, for which it was mistaken by Capt. Blakiston's party on the Yangtsze. The Koel does not occur in that region.

456. CUCULUS FLAVIVENTRIS, Scop.; Sonn. Voy. t. 79.

Cuculus hyperythrus, Gould, B. of As. pt. viii.

Mr. Gould figures a bird said to have come from Shanghai; but the only bird that I can find in the British Museum answering to this description is labelled "Manilla." I included this species in my former catalogue (P. Z. S. 1863, p. 265) in the belief that I had an immature specimen of it from Shanghai; but this last I now find belongs to the following species. It is not, improbable, however, that this species may occur in China.

457. CUCULUS MICROPTERUS, Gould, P. Z. S. 1837, p. 137.

Cuculus affinis, A. Hay, J. A. S. B. xv. 18 (large variety).

Cuculus michieanus, Swinhoe, Ann. & Mag. Nat. Hist. vol. vi. 4th series, p. 153.

This very distinct species may at once be recognized by its brown back, wings, and tail, the latter with a broad black bar at the end, connecting the subgenus *Hierococcyx* with the true Cuckoos. It is almost divisible into two varieties, of larger and smaller form; but these do not differ in notes according to Jerdon, nor indeed are they constant in size. I found the species on the Upper Yangtsze in company with the *C. sparveroides*, but not so common. Our birds are of the large form. They were very noisy, flying from tree to tree in an agitated manner, and uttering notes which are well syllabled in its Bengalese name, *Bou-kotáko*. I have an immature bird of the same from Shanghai, as noted under the foregoing species (P. Z. S. 1863, p. 265).

458. CUCULUS CANORUS, L.; Ibis, 1860, p. 62, 1863, p. 96; P. Z. S. 1862, p. 319, 1863, p. 264.

Cuculus striatus, Ibis, 1861, pp. 259, 340 (in part).

This bird occurs in the mountains of the south in spring, extending northwards to Pekin. During its migration we meet with it on the plains. Its note is precisely that of the home bird, and I can detect no constant peculiar characters in its plumage to entitle it to separation from the European bird.

459. CUCULUS POLIOCEPHALUS, Lath. Hist. of B. iii. p. 181.

Cuculus himalayanus, Gould, Cent. pl. 54 (hepatic plumage); P. Z. S. 1863, p. 265.

Cuculus tamsuicus, Swinh. Ibis, 1865, p. 108.

A miniature of the last. I have specimens from Tamsuy (N.W. Formosa), Amoy, and Szechuen.

460. CUCULUS STRIATUS, Drapiez, Dict. Class. d'Hist. Nat.; Ibis, 1862, p. 263.

Cuculus himalayanus, Vig.; Jerd. B. of Ind. p. 323.

Cuculus striatus, Ibis, 1861, pp. 259, 340 (in part.).

Cuculus tenuirostris, Temm.

Cuculus canoroïdes, S. Müll.
Cuculus optatus, Gould.
Cuculus canorus, Ibis, 1863, p. 396.
Cuculus monosyllabicus, Swinh. Ibis, 1865, p. 545.
Cuculus kelungensis, Swinh. Ibis, 1863, p. 394.

I have a large series of this form of Cuckoo from Amoy, Formosa, and Pekin, and find them so variable in size, and in length and form of bill, that I give up in despair making species of them. From South Formosa I got a specimen with small bill and peculiar note; this I described as *C. monosyllabicus*; but it agrees with a specimen from Java labelled *C. tenuirostris*, Temm., sent me by Prof. Schlegel; and a series from Amoy and a bird from Pekin are also the same. From North Formosa I procured birds with large and long bills. These I described as *C. kelungensis*, and I have a specimen from Amoy with the same features (noted as *C. micropterus*, P. Z. S. 1863, p. 265); but they do not possess a single other character to distinguish them. From Amoy I have one with a particularly short and broad bill, but also with no other character; and a second with a thick curved bill, of large size, and with all the claws deep black. This last I determined as *C. canoroides* of S. Müller; but on glancing through my series I find many of the lesser and small-billed form, as also many of the long-billed form, with more or less black claws, in fact almost every gradation from pure yellow to black. I come therefore (I must confess, most reluctantly) to the conclusion that they all belong to the same variable species.

Like all the Cuckoos, these birds in China are only summer visitants.

461. TRERON FORMOSÆ, Swinh. Ibis, 1863, p. 396, 1865, p. 540, 1866, p. 312.

South Formosa.

462. SPHENOCERCUS SORORIUS, Swinh. Ibis, 1866, pp. 311, 406.

Sphenocercus formosæ, ♂, Ibis, 1866, p. 122.
Treron chæroboatis, Ibis, 1866, pp. 313, 406.

South Formosa. Like *Treron sieboldii*, T. & S., of Japan, but yellower about the head, and with the green of the back, wings, and tail clearer and not washed with the brownish oil-colour of the other.

463. OSMOTRERON DOMVILII, Swinh. Ibis, 1870, p. 354.

Hainan.

464. CARPOPHAGA SYLVATICA (Tick.); Ibis, 1870, p. 355.

Columba sylvatica, Tickell, J. A. S. ii. p. 581.
Hainan.

465. COLUMBA LIVIA, Briss. Av. i. p. 82; P. Z. S. 1870, p. 444.

In a feral state about the Pekin plains.

466. COLUMBA RUPESTRIS, Bp. Consp. Av. ii. p. 48; P. Z. S. 1863, p. 306, 1870, p. 434.

Columba œnas, var. *rupestris*, Pall. Zoogr. t. 35.
Columba leucozonura, Swinh. Ibis, 1861, p. 259, 1863, p. 88.
North China.

467. DENDROTRERON HODGSONII (Vig.); Bp. Ic. Pig. t. 61.

Columba hodgsonii, Vigors, P. Z. S. 1832, p. 16.

Sent from Moupin by Père David.

468. PALUMBUS PULCHRICOLLIS (Hodgs.); Gould, B. of As. pl.; Ibis, 1866, pp. 313, 396.

Columba pulchricollis, Hodgs. J. A. S. xiv. p. 866.
Formosa.

469. COCCYZURA MINOR.

Macropygia tusalia, var. *minor*, Swinh. Ibis, 1870, p. 355.
Hainan.

470. TURTUR RUPICOLA (Pall.); Ibis, 1863, p. 397, 1865, p. 541, 1866, p. 313, 1867, p. 396, 1870, p. 356; P. Z. S. 1863, p. 306.

Turtur orientalis (Lath.); Ibis, 1860, p. 63, 1861, pp. 49, 341.
Turtur gelastes, T. & S. F. J.; Ibis, 1862, p. 261; P. Z. S. 1870, p. 446.

South China, Formosa, and Hainan in winter. Differs considerably from *T. meena*, Sykes, of India.

471. TURTUR CHINENSIS (Scop.); Ibis, 1860, p. 62, 1861, p. 49, 1862, p. 261, 1863, p. 397, 1865, p. 540, 1870, p. 356; P. Z. S. 1863, p. 306.

South China; Hainan; Formosa.

472. TURTUR RISORIUS, L.; Pl. Enl. 244; P. Z. S. 1870, p. 446.

Turtur risorius (albino), Ibis, 1865, p. 541, 1866, p. 298.

About the trees of villages near the Great Wall, but not at Pekin itself.

473. TURTUR HUMILIS, Temm. Pl. Col. 258, 259; Ibis, 1860, p. 63, 1862, p. 261, 1863, p. 397, 1865, p. 540, 1870, p. 356; P. Z. S. 1863, p. 306.

South China to Shanghai; Formosa; Hainan.

474. CHALCOPHAPS INDICA (L.); Ibis, 1870, p. 356.

Hainan.

475. CHALCOPHAPS FORMOSANA, Swinh. Ibis, 1865, pp. 357, 540.

Formosa, south of Takow.

476. **Syrrhaptes paradoxus** (Pall. It. t. 5); Ibis, 1861, p. 341; P. Z. S. 1863, p. 306.

Breeds in Mongolia, roaming to the Pekin plains in winter (*David*).

477. **Pavo muticus**, L.; Ibis, 1870, p. 359, note.

South-west China.

478. **Polyplectron bicalcaratum** (L.).

Polyplectron chinquis, P. Z. S. 1863, p. 307.
South-west China.

479. **Phasianus torquatus** (Gmel.); Ibis, 1861, pp. 49, 341, 1862, p. 259, 1865, p. 349, 1867, pp. 232, 390, 402; P. Z. S. 1863, p. 307.

Canton to Pekin, and westwards to Hankow.

480. **Phasianus formosanus**, Elliot, P. Z. S. 1870, p. 406.

Phasianus torquatus, Swinh. Ibis, 1863, p. 401, 1866, p. 404.
Formosa.

481. **Phasianus decollatus**, Swinh. P. Z. S. 1870, p. 135.

Province of Szechuen.

482. **Phasianus sladeni**, Anderson, MS.; Elliot, P. Z. S. 1870, p. 408.

Phasianus elegans, Elliot, Ann. & Mag. Nat. Hist. 4th series, vi. p. 312.

Brought down the Upper Yangtsze, probably from Kwirchow province, and now alive in the Society's Gardens. Procured by Dr. Anderson in Momien, province Yunnan. There is a specimen apparently of this species in the British Museum, which was received many years ago from this Society, and was at the time supposed to be a cross between *P. colchicus* and *P. versicolor* of Japan.

483. **Syrmaticus reevesii** (Gray), Ind. Zool. pl. 39.

Phasianus reevesii, P. Z. S. 1863, p. 307.
Eastern Szechuen, Western Hoopih, and northwards to near Pekin.

484. **Chrysolophus pictus** (Linn.).

Thaumalea picta (L.); P. Z. S. 1863, p. 307.
Western China into Kokonor.

485. **Chrysolophus amherstiæ** (Leadb.).

Thaumalea amherstiæ, Leadb. Linn. Tr. xvi. pl. 15; Swinh. P. Z. S. 1863, p. 307, 1870, p. 111.
Moupin; Western Yunnan (*Dr. Anderson*).

486. PUCRASIA XANTHOSPILA, G. R. Gr. P. Z. S. 1864, p. 159, pl. 20.

Pucrasia davidiana, M.-Edwards, N. Arch. du Mus. i. t. 1, 2, 3.
North-west China.

487. CROSSOPTILON AURITUM (Pall.).

Phasianus auritus, Pall. Zoogr. ii. p. 86.
Crossoptilon cærulescens, David, MS.; M.-Edw. C. R. 1870, p. 538.
Kokonor (*David*).

488. CROSSOPTILON MANTCHURICUM, Swinh. P. Z. S. 1862, p. 287, 1863, p. 306; Ibis, 1865, p. 112.

North China into Mantchuria.

489. CROSSOPTILON DROUYNII, Milne-Edwards, N. Arch. du Mus. iv. (1868), Bull. p. 85, pl. 3.

Crossoptilon tibetanum, Hodgs.?

Sent from Moupin by Père David.

490. EUPLOCAMUS NYCTHEMERUS (L.).

South China.

491. EUPLOCAMUS SWINHOII, Gould, P. Z. S. 1862, p. 284; B. of As. pl.; Ibis, 1863, p. 401, 1865, pp. 353, 538, 1866, pp. 133, 308, 404, 405, 1867, pp. 232, 409.

Formosa.

492. LOPHOPHORUS L'HUYSII, J. Verr. Bull. Soc. d'Acclimat. 2de sér. iv. (1867) p. 706; Sclater, P. Z. S. 1868, p. 1, pl. 1.

Moupin.

493. GALLUS FERRUGINEUS (Gmel.); Ibis, 1870, p. 357.

Phasianus gallus, L.; Ibis, 1867, p. 233.
Hainan.

494. TETRAOPHASIS OBSCURUS, Elliot, Mon. Phas. pt. iii.

Lophophorus obscurus, J. Verr. N. Arch. du Mus. 1869, Bull. p. 33, pl. 6.
Moupin (*David*).

495. CERIORNIS TEMMINCKII (Gray); Swinh. P. Z. S. 1863, p. 307.

West China.

496. CERIORNIS CABOTII, Gould, P. Z. S. 1857, p. 161; B. of As. pl.; Ibis, 1865, p. 350; P. Z. S. 1863, p. 307.

South-west China.

497. Ithaginis geoffroyi, J. Verr. Bull. Soc. d'Acclimat. 2de série, iv. (1867) p. 706.

Moupin (*David*).

498. Francolinus sinensis (Osb.); Ibis, 1870, p. 359; P. Z. S. 1863, p. 307.

Francolinus perlatus (Gmel.); Ibis, 1860, p. 63, 1861, p. 50, 1862, p. 259, 1867, p. 406.
Francolinus maculatus, Gray, Zool. Misc. p. 2.
South China, Canton to Amoy; Hainan.

499. Perdix barbata, Verr. et Des Murs, P. Z. S. 1863, p. 62, pl. 9. pp. 307, 370.

Very common in Mongolia; rarer on the bare mountains near Pekin; never on the plain (*David*).

500. Oreoperdix crudigularis, Swinh. Ibis, 1864, pp. 426, 426, 1865, p. 542, 1866, pp. 133, 134, 401.

Formosa.

501. Bambusicola thoracica (Temm.); P. Z. S. 1863, p. 307.

Perdix sphenura, Gray, Zool. Misc. p. 2.
Arboricola bambusæ, Ibis, 1862, p. 259.
Fokien province to south bank of Yangtsze.

502. Bambusicola sonorivox, Gould, P. Z. S. 1862, p. 285; B. of As. pl.; Ibis, 1863, p. 399, 1865, p. 542, 1866, pp. 134, 401, 404.

Formosa.

503. Bambusicola fytchii, Anderson, P. Z. S. 1871, *anteà*, p. 214, Pl. XI.

Procured by Dr. Anderson at Ponsee (Yunnan province).

504. Caccabis chukar, var. pubescens, Ibis, 1865, pp. 353, 542, 1867, p. 402; P. Z. S. 1870, p. 439.

Perdix chukar, Gray, Hardw. Ill. Ind. Zool. i. pl. 54.

North China, southwards to north bank of Upper Yangtsze, in the gorges. Chinese specimens have a deep blush of rosiness over their upper plumage, which is not seen in Himalayan skins.

505. Lerwa nivicola (Hodgs.).

Sent from Moupin by Père David.

506. Tetrastes bonasia (L.).

Northern Chelee (*David*).

507. Tetrao tetrix, L.

Northern Chelee (*David*).

508. COTURNIX COMMUNIS, Bonn. Ibis, 1863, p. 398; P. Z. S. 1863, p. 308.

Coturnix chinensis (L.), Ibis, 1860, p. 63.
Coturnix dactylisonans, Ibis, 1860, p. 358, 1861, pp. 50, 260, 341.
Coturnix japonica, Bp.

The Quails of North China that come south in winter have more or less rufous on their faces, and are more richly coloured than those that pass the summer with us; but the two races seem to blend into each other, and it is not easy to draw a line of distinction between them.

509. EXCALFACTORIA CHINENSIS (L.); Ibis, 1863, p. 398, 1870, p. 360; P. Z. S. 1863, p. 308.

Coturnix chinensis (L.); Ibis, 1861, p. 50.
Coturnix caineana, ♀, Swinh. Ibis, 1865, p. 351.
South China, Formosa, and Hainan.

510. TURNIX DUSSUMIERI.

Hemipodius dussumieri, Temm. Pl. Col. (1838) pl. 454. f. 2; Gould, B. of As. pt. xxi.

Turnix sykesi, A. Smith, Zool. of South Africa; Jerdon, B. of Ind. iii. p. 600.

In the winter 1868–69, when I was last in Formosa, I procured several females and one male of the little *Turnix* that abounds on the low grassy hills about fifteen miles from Takow. It had escaped me before, but its eggs I had got in abundance. This I cannot distinguish from the small Button-Quail of India. The females were bigger than the male, but of similar plumage. They both had deep-bluish bills, and the former bluish grey legs, the legs of the male being more flesh-coloured. This bird has not yet been met with in China.

511. AREOTURNIX ROSTRATA.

Turnix rostrata, Swinh. Ibis, 1865, pp. 542, 544, 1866, pp. 131, 297, 403, 1867, p. 230.

Turnix ocellatus, Ibis, 1863, p. 398.

Allied to *T. plumbipes*, Hodgs., *T. ocellata*, Jerdon (nec Scop.), but of a good deal larger size, with much more powerful bill and legs. Frequents the lowest hill-ranges of South Formosa, showing a preference for rocky places covered with scrub. The female is much larger than the male, and acquires a black throat in summer.

512. AREOTURNIX BLAKISTONI, n. sp.

Turnix ocellata, Ibis, 1866, p. 131; P. Z. S. 1863, p. 308.

A male specimen of the *T. ocellata* group was procured by Capt. Blakiston at Canton, and kindly given to me. This differs too much from the last for me to consider it of the same species. Its nearest ally is the *T. pugnax*, Temm., of Malacca, but it is smaller, shorter-toed, and possesses a remarkably small bill. Instead of spots it has numerous bands across the breast; and its upper parts are very rufous. I propose to separate it under the name of its discoverer.

513. HEMIPODIUS VICIARIUS, n. sp.

Turnix jondera, Hodgs.?; Swinh. Ibis, 1861, p. 50.

Turnix dussumieri, Ibis, 1861, p. 341.

Turnix maculosa, Ibis, 1866, p. 131; P. Z. S. 1863, p. 308, 1870, p. 442.

The Indian species of this group is the *Turnix jondera*, Hodgs., figured in Gray and Mitchell's 'Genera of Birds' (*T. dussumieri*, Jerd. B. of India, iii. p. 599); and a similar but larger bird is found in Burmah (*T. blanfordi*, Blyth, J. A. S. B. 1863, p. 80). The latter from its size (wing 4 inches) seems to answer to the original *Hemipodius maculosus*, Temm. Pig. et Gall. iii. p. 631, 1815 (*maculatus*, Vieill. Gal. des Ois. 1834, iv. p. 51, pl. 217), the locality of which is doubtfully given as New Holland. Our bird, which ranges from Canton to Pekin, differs from these in wanting the red collar and the median stripe on the crown. The feathers on the crown are black margined with reddish brown, the breast is bright buff; the feathers of the back and rump are blotched and finely waved with black, and most of them have long ochreous spots on their margins. It is about the size of *T. blanfordi*, and in general plumage pretty similar. Irides white. Upper mandible brown; lower mandible and legs ochreous yellow. The females are rather larger than the males, but do not seem to differ in plumage. The gizzard of a female was large and heart-shaped; cæca long and bulging; its trachea swollen above the junction with the bronchi.

514. OTIS TARDA, L.; P. Z. S. 1863, p. 308.

"Tungusis Dauuriæ *Todok*," Pallas, Zoogr. ii. p. 97.

Shanghai and Hankow in winter. "Pekin in winter" (*David*).

I have a female specimen from Shanghai, which is smaller than the ordinary European bird, and more broadly banded with black on the upper parts.

Père David speaks of a smaller Bustard, called by the Chinese at Pekin "*Kepoo*." He saw a flock of them in Mongolia (Catalogue des Oiseaux à Pékin).

515. GRUS CINEREA, Bechst.; Ibis, 1861, p. 409, 1870, p. 362; P. Z. S. 1863, p. 308; Zoologist, 1861, p. 7507.

South China in winter. Passes over the Pekin plain in September and April; commoner towards Mongolia (*David*).

516. GRUS MONACHUS, Temm.; Ibis, 1867, p. 413; P. Z. S. 1863, p. 309.

Shanghai market in winter.

517. GRUS LEUCAUCHEN, Temm.

Passes in small numbers along the mountains of Seuen-hwa-foo (*David*).

518. GRUS VIRIDIROSTRIS, Vieill.; P. Z. S. 1863, p. 309, 1870, p. 428.

Antigone montignesia, Bp. Consp. Av. p. 100.

Brought to market for sale at Shanghai and at Pekin.

519. GRUS LEUCOGERANUS, Pall.

Breeds in the province of Leantung (*David*).

520. GRUS VIRGO, L.; Ibis, 1867, p. 413.

Abündant in spring and autumn at Seuen-hwa-foo. Breeds in Mongolia (*David*).

521. GLAREOLA ORIENTALIS, Lath.; Ibis, 1861, p. 342, 1863, p. 404; P. Z. S. 1863, p. 309.

Tientsin; Formosa.

522. VANELLUS CRISTATUS, Mey. & Wolf; Ibis, 1861, p. 342, 1865, p. 349, 1867, p. 399; P. Z. S. 1863, p. 309.

Wanders down as far south as Canton and into Formosa in winter. Breeds in Mongolia (*David*).

523. CHETTUSIA CINEREA.

Lobivanellus cinereus, Blyth, P. Z. S. 1863, p. 309.
Lobivanellus inornatus, Schleg. F. J.; Ibis, 1860, p. 359.

From the banks of the Yangtsze to Pekin. Mongolia (*David*).

524. HOPLOPTERUS VENTRALIS (Cuv.); Ibis, 1870, p. 361.

Hainan.

525. SQUATAROLA HELVETICA (L.); Ibis, 1860, p. 63, 1861, pp. 51, 342, 1863, p. 404, 1870, p. 360; P. Z. S. 1863, p. 309.

Down the coast in winter.

526. CHARADRIUS FULVUS, Gm.

Charadrius longipes, Temm.; Ibis, 1863, p. 404, 1870, p. 360; P. Z. S. 1862, p. 319, 1863, p. 309.
Charadrius virginicus, Ibis, 1860, p. 358, 1861, pp. 51, 342, 1862, p. 254.
Charadrius pluvialis, Ibis, 1862, p. 307.
Throughout China and Formosa; Hainan.

527. EUDROMIAS VEREDUS (Gould).

Ægialites veredus, P. Z. S. 1870, pp. 141, 430.
Charadrius veredus, Gould, P. Z. S. 1848, p. 38.
Shanghai and Australia (*Gould*); Macassar (*Wallace*). Procured at Pekin by Père David.

528. ÆGIALITES GEOFFROYI (Wagler); Ibis, 1861, p. 51, 1863, p. 405, 1870, p. 360; P. Z. S. 1870, p. 141.

Ægialites leschenaultii, Ibis, 1861, p. 342, 1862, p. 255; P. Z. S. 1863, p. 309.

China coast in winter; Formosa.

529. ÆGIALITES MONGOLUS (Pall.); Swinh. P. Z. S. 1870, p. 140.

Ægialites mongolicus, Swinh. Ibis, 1870, p. 360; P. Z. S. 1863, p. 310.

Hiaticula inornata, Gould, B. of Austr. vi. pl. 19.

China coast in winter.

530. ÆGIALITES HARTINGI, Swinh. P. Z. S. 1870, p. 136, pl. 12.

Flats of the Upper Yangtsze (Szechuen) in spring.

531. ÆGIALITES CANTIANUS (Lath.); Ibis, 1860, p. 63, 1861, pp. 51, 342; P. Z. S. 1863, p. 310, 1870, p. 138.

China coast in winter.

532. ÆGIALITES DEALBATUS, Swinh. P. Z. S. 1870, p. 138; Ibis, 1870, p. 361.

Ægialites cantianus, Ibis, 1860, p. 429, 1863, p. 405.

Resident on the coasts of South China and Formosa.

533. ÆGIALITES HIATICULA (L.)?

Charadrius longipes, David, Nouv. Arch. 1867, Bull. p. 38.

"Close to *C. hiaticula*, but with longer legs; I obtained a single specimen of this in winter at Pekin" (*David*).

534. ÆGIALITES DUBIUS (Scop.).

Ægialites philippinus, Ibis, 1862, p. 255, 1863, p. 406; P. Z. S. 1863, p. 310.

Ægialites curonicus, P. Z. S. 1870, p. 137.

Ægialites intermedius, Ibis, 1870, p. 361.

Ægialites pusillus, Ibis, 1860, p. 63, 1861, p. 51.

Charadrius philippinus, Ibis, 1861, pp. 260, 342.

Throughout South China, Formosa, and Hainan in winter; breeds in North China (Talien Bay). Chinese birds agree with the European. The race found in Bengal is smaller, and is probably the *Æ. minutus* (Pall.). *Æ. intermedius* (Ménétriés) appears to be a lesser form of *Æ. hiaticula* (L.) with more slender bill, which sometimes occurs in England, and is considered by many to be merely the latter species not fully developed. *Æ. pusillus* (Horsf.) of Java and *Æ. philippinus* (Lath.) of Luzon I take to be the same as our bird; as being only winter visitants to the archipelago, they would naturally be the species that passes our coast in spring and autumn.

535. **HÆMATOPUS OSCULANS**, n. sp.

Hæmatopus ostralegus, Swinh. Ibis, 1860, p. 63, 1861, pp. 261, 342.

Hæmatopus longirostris, Swinh. Ibis, 1863, p. 406; P. Z. S. 1863, p. 310.

On drawing up my last list and on finding our bird to be different from the European species, I set it down as *H. longirostris*, Gray, without, however, comparing specimens. Prof. Schlegel (Mus. des Pays-Bas) draws attention to my mistake, but identifies the bird with *H. ostralegus*. On careful comparison I find it intermediate. It has white on its primary quills, but not to such an extent as in *H. ostralegus*; and it has the long bill and black tips to its white upper tail-coverts as in *H. longirostris*, but the tip-spots are smaller. Thus holding an intermediate position between the two, it is impossible to class it with either species, and I would propose to separate it as above.

Characters.—First three rectrices with black shafts, the fourth showing a little white, which increases and expands on the quills that follow (in *H. ostralegus* the white commences on the first quill, and in *H. longirostris* the shafts are all black). The upper tail-coverts that overlap the tail tipped with black (pure white in *H. ostralegus*). Bill, from the forehead, 3·6 inches. These characters are taken from an adult male shot in Talien Bay in July. An immature bird shot in November at Swatow shows the same long bill, small extent of white on the wing, and dark tips to the extreme uropygials, but its dark parts are brown instead of black. Neither specimen has the white collar. This Oyster-catcher breeds in North China (Talien Bay), and wanders down the coast in winter as far, at least, as Swatow.

536. **RECURVIROSTRA AVOCETTA**, L.; Ibis, 1860, p. 66, 1861, p. 343, 1863, p. 406; Zoologist, 1860, p. 7103; P. Z. S. 1863, p. 311.

Recurvirostra sinensis, Ibis, 1867, p. 401.

China coast in winter. "Is found in May at Ordo near the Yellow River" (*David*).

537. **HIMANTOPUS CANDIDUS**, Bonnaterre; L.

Himantopus melanopterus, Temm.

One seen at Pekin by Père David (Catalogue).

538. **TOTANUS GLOTTIS**, L.; Ibis, 1863, p. 406, 1870, 364; P. Z. S. 1863, p. 311.

Totanus glottoides, Vig.; Ibis, 1860, p. 66, 1861, p. 343.
Totanus glottis, Ibis, 1862, p. 254.
General in winter.

539. **TOTANUS STAGNATILIS**, Bechst.; Ibis, 1862, p. 254, 1863, p. 406, 1870, p. 364; P. Z. S. 1863, p. 311.

Formosa; Amoy; Hainan.

540. Totanus fuscus, L.; Ibis, 1862, p. 254, 1863, p. 97; P. Z. S. 1862, p. 319, 1863, p. 311, 1870, 427.

Canton; Tientsin; Shanghai.

541. Totanus calidris, L.; Ibis, 1861, p. 343, 1862, p. 254, 1863, p. 407, 1865, 347, 1870, p. 364; P. Z. S. 1862, p. 320, 1863, p. 311.

Totanus fuscus, Ibis, 1866, p. 295.
General in winter.

542. Totanus glareola, L.; Ibis, 1860, p. 66, 1861, p. 343, 1863, p. 407, 1870, p. 363; P. Z. S. 1863, p. 311.

Totanus affinis, Horsf.; Ibis, 1866, p. 294; P. Z. S. 1863, p. 311.
Hurries past in early autumn, and returns late in spring.

543. Totanus ochropus, L.; Ibis, 1860, p. 66, 1861, p. 343, 1862, p. 254, 1863, p. 407, 1870, p. 363; P. Z. S. 1863, p. 312.

Throughout China and Formosa.

544. Totanus incanus, Vieill. N. D. d'H. N. vi. p. 400.

Totanus brevipes, Vieill. *l. c.* p. 410; Ibis, 1863, p. 407, 1867, p. 390; P. Z. S. 1863, p. 312.
Totanus pulverulentus, M. & S.; Ibis, 1860, pp. 132, 359, 1861, p. 343, 1862, p. 254.
Chinese and Formosan coasts in winter.

545. Tringoides hypoleucus (L.); Ibis, 1860, p. 66, 1861, p. 343, 1862, p. 259, 1863, p. 408, 1870, p. 363; P. Z. S. 1863, p. 312.

Throughout China, Formosa, and Hainan.

546. Terekia cinerea (Gmel.); Ibis, 1863, p. 97; P. Z. S. 1863, p. 312.

Terekia javanica, P. Z. S. 1862, p. 319.
Tientsin (*Fleming*).

547. Limosa uropygialis, Gould; Ibis, 1863, p. 409, 1870, p. 362; P. Z. S. 1863, p. 312.

Limosa lapponica seu *rufa*, Ibis, 1861, p. 410, 1863, p. 97, 1867, p. 388.

Amoy, Formosa, and Hainan, in winter. Breeds in Amoorland and Alaska; wanders during our cold season to the Malay archipelago, Australia, and New Zealand.

548. Limosa brevipes, G. R. Gray, Brit. Mus. Cat. *Grallæ*, p. 95.

Limosa melanuroides, Gould.
Limosa melanura, Ibis, 1868, p. 58; P. Z. S. 1863, p. 313.
One specimen procured at Amoy on the 30th of April, 1867, in

partial summer plumage. Probably breeds in Amoorland, if not in Japan also, ranging in winter to Borneo, the Moluccas, Australia, and New Zealand. The European *L. ægocephala* (L.) is the winter species in India.

549. PSEUDOSCOLOPAX SEMIPALMATUS, Jerdon, P. Z. S. 1863, p. 313.

Micropalama taczanowskia, J. Verr.

Teintsin; Hankow; Trans-Baikal (*J. Verreaux*); India (*Blyth and Jerdon*); Borneo (*Schlegel*).

550. SCOLOPAX RUSTICULA, L.; Ibis, 1860, p. 66, 1861, pp. 56, 343, 1863, p. 415; P. Z. S. 1863, p. 313.

Throughout China in winter.

551. GALLINAGO SOLITARIA, Hodgs. J. A. S. vi. p. 491; P. Z. S. 1863, p. 313.

Pekin (*David*). Specimens from South China, previously referred to this, belong to the following species.

552. GALLINAGO MEGALA, Swinh. Ibis, 1861, p. 343, 1862, p. 255, 1863, p. 415, 1865, p. 232; P. Z. S. 1863, p. 313.

Gallinago solitaria?, Ibis, 1860, pp. 66, 132, 359, 1864, p. 370, 1865, p. 355, 1866, pp. 134, 294, 1867, p. 233.

Gallinago stenura, Radde, Reise, Taf. xiii.

Throughout China and Formosa in seasons of migration. I have seen specimens from Lake Baikal.

553. GALLINAGO HORSFIELDI (Gray); Zool. Misc. p. 2.

Gallinago stenura (Bp.); Ibis, 1860, p. 66, 1861, pp. 56, 343, 1862, p. 259, 1863, p. 415, 1865, p. 232, 1867, p. 234, 1870, p. 362; P. Z. S. 1863, p. 314.

Gallinago biclava, Hodgs.

Gallinago heterocerca, Cab.

Throughout China, Hainan, and Formosa in winter. Probably goes north to breed; specimens have been sent from Lake Baikal.

554. GALLINAGO SCOLOPACINA, Bp.; Ibis, 1863, p. 415, 1865, p. 347, 1867, p. 234, 1870, p. 362; P. Z. S. 1863, p. 314.

Gallinago burka, Swinh. Ibis, 1865, p. 231; P. Z. S. 1863, p. 314.

Gallinago uniclava, Hodgs.; Ibis, 1860, p. 66, 1861, pp. 56, 343, 1862, p. 259.

Gallinago media, Ibis, 1866, p. 294.

China, Formosa, and Hainan, in winter.

555. LIMNOCRYPTES GALLINULA (L.).

Gallinago gallinula, P. Z. S. 1863, p. 314.

I have never seen this bird in China. One specimen was procured by a sporting friend in Formosa, and he sent it to me as the only one he had ever met with in our part of the world.

556. RHYNCHÆA BENGALENSIS (L.); Ibis, 1865, pp. 230, 347, 1866, p. 137, 1870, p. 362; P. Z. S. 1863, p. 314.

Rhynchæa sinensis, Lath. Ibis, 1864, p. 370, 1867, p. 404.
Rhynchæa orientalis, Horsf.
Rhynchops sinensis, Ibis, 1861, p. 267.

Throughout China and Formosa in summer. I find that Painted Snipes from Africa have the chin bare, which is not the case with specimens from India and China. *R. capensis* (Gmel.) may therefore rank as a distinct species.

557. CALIDRIS ARENARIA (L.); Ibis, 1860, p. 359, 1861, p. 342, 1863, p. 414, 1870, p. 363; P. Z. S. 1863, p. 315.

General in winter.

558. STREPSILAS INTERPRES (L.); Ibis, 1860, p. 359, 1861, p. 342, 1862, p. 255, 1863, p. 414, 1870, p. 361; P. Z. S. 1863, p. 315; Zoologist, 1860, p. 7103.

559. LOBIPES HYPERBOREUS (L.); Ibis, 1861, p. 412, 1863, p. 415, 1865, p. 358, 1870, p. 363; P. Z. S. 1863, p. 315; Zoologist, 1861, p. 7643.

560. TRINGA TENUIROSTRIS (Horsf.); P. Z. S. 1863, p. 315.

Totanus crassirostris, T. & S. Faun. Jap. lxiv.
Schæniclus magnus, Gould, B. of Austr. vi. pl. 33.

561. TRINGA CANUTUS, L.; P. Z. S. 1863, p. 315.

Procured at Shanghai.

562. TRINGA PLATYRHYNCHA, Temm.; Ibis, 1862, p. 255, 1863, p. 412, 1870, p. 363; P. Z. S. 1863, p. 316.

Limicola pygmæa, Midd. Sib. Reise.

China and Formosa in winter. The *Tringa pygmæa* of Latham, as Prof. Newton has proved to me, is based on *T. subarcuata*, and the name ought not to be applied to this species.

563. TRINGA CINCLUS, var. CHINENSIS.

Tringa chinensis, Gray, Zool. Misc. p. 2; Ibis, 1862, p. 255.
Tringa cinclus, Ibis, 1860, p. 66, 1861, p. 412, 1863, pp. 97, 411; P. Z. S. 1863, p. 316.
Tringa subarquata, Ibis, 1861, p. 342.
Tringa alpina, Ibis, 1866, p. 136, 1870, p. 363.

In length and thickness of bill surpassing *T. cinclus*, var. *americana*, Baird, with longer toes. In summer dress remarkable for the big black blotches on its breast, and for the blackness and want of rufescence of its upper parts.

Chinese and Formosan coasts in winter, coming early and retiring late.

564. Tringa acuminata (Horsf.); Ibis, 1863, p. 412; P. Z. S. 1863, p. 316.

Tringa ——?, Ibis, 1861, p. 342.
Tringa pectoralis, Ibis, 1863, p. 97.

Passes our coasts early, and returns late.

565. Tringa damacensis (Horsf.); Ibis, 1863, p. 413; P. Z. S. 1863, p. 316.

Tringa, sp., Ibis, 1860, p. 359, 1861, p. 342.
Tringa subminuta, Midd. Sib. Reis. p. 222, t. xix. f. 6; Ibis, 1862, p. 255, 1863, p. 97.

Passes our coasts early and returns late.

566. Tringa salina, Pall. It. iii. p. 700.

Tringa ruficollis, Lath. Av. v. p. 183.
Tringa albescens, Temm. Pl. Col. 41. fig. 2; Ibis, 1863, p. 413, 1870, p. 363; P. Z. S. 1863, p. 316.
Tringa minuta, Ibis, 1860, pp. 342, 358, 1862, p. 255.

The eastern representative of *T. minuta*. Passes the China coast early, and returns late, on its winter migration. All my specimens are of this race; but I have seen the true *T. minuta*, in summer plumage, from Lake Baikal. Mr. Gould reports its breeding in Australia (Hand-b. B. of Austr. ii. p. 258)!

567. Tringa subarcuata, L.; P. Z. S. 1862, p. 319, 1863, p. 317.

Procured in Amoy and Formosa, in partial summer dress, in the middle of May. Tientsin (*Fleming*).

568. Tringa temminckii, Leisl.; Ibis, 1860, p. 66, 1861, p. 342, 1862, p. 255, 1863, p. 412; P. Z. S. 1863, p. 317.

Throughout China in winter.

569. Eurinorhynchus pygmæus (L.).

Eurinorhynchus orientalis, Blyth, Ibis, 1867, p. 234.

Procured once at Amoy.

570. Numenius minutus, Gould, P. Z. S. 1840, p. 176, 1863, p. 317.

Numenius minor, Müll. & Schleg. Verh. Nat. Gesch. p. 110; Ibis, 1861, p. 411, 1863, p. 409.

Amoy. Received also from Trans-Baikal, so that it probably goes south to India, and will be the *N. arcuatulus*, Hodgs., of Nepal. Schlegel has it from Amboina (Mus. des Pays-Bas), and Gould from New South Wales. It passes our coast early, and returns late. Mr. Gould met with the bird on the 4th April (Handb. B. Austr. ii.

p. 280). Leaving Australia a few days later, there is no reason why these birds should not pass by the Moluccas, and onwards along the China coast in time to nidificate in Amoorland in June.

571. **Numenius phæopus** (L.); P. Z. S. 1863, p. 317.

Pekin to Shanghai in winter.

572. **Numenius luzoniensis** (Gmel.), Syst. Nat. 1788, i. p. 656.

Numenius atricapillus, Vieill.

Numenius uropygialis, Gould, P. Z. S. 1840, p. 175; Ibis, 1863, p. 409, 1866, p. 137.

Formosa; South China coast. Throughout the islands to Australia. Breeds in southern latitudes.

573. **Numenius lineatus**, Cuv. Règn. An. 2nd ed. i. p. 52, note 2; Blyth, Ibis, 1867, p. 167.

Numenius major, T. & S. Faun. Jap. pl. lxvi.; Ibis, 1860, p. 66, 1863, p. 410, 1867, p. 391, 1870, p. 363; P. Z. S. 1863, p. 318.

Numenius arcuatus, T. & S. Faun. Jap.; Swinh. Ibis, 1863, p. 410; P. Z. S. 1863, p. 318.

Numenius cassinii, Swinh. Ibis, 1867, p. 398; P. Z. S. 1863, p. 317.

The long-billed *N. major* is the female, and the shorter-billed so-called *N. arcuatus* is the male; and *N. cassinii* is a small variety of the same species, at once distinguishable from *N. arcuatus* of Europe by its white unspotted axillaries. On the China coast the long-billed birds often associate with the short bills, and, as Prof. Schlegel observes (Mus. des Pays-Bas), are of similar plumage. I have examined a number of both, and in every case I have found the long-bills females and the short-bills males. I am therefore convinced that they are mere sexes of the same species. Prof. Schlegel points out the same birds occurring on the coast of South Africa, where they have been also set apart as distinct species. I have compared a specimen from South Africa, kindly given me by Mr. R. B. Sharpe; and it tallies completely with our male birds from China. It follows, then, that the winter Curlew of India will be the same, and that this migration is another instance of that exemplified in the case of *Erythropus amurensis*, Radde, of a North-east-Asian bird passing through India to Africa in winter.

It spreads down the Chinese and Formosan coasts, during the cold season, as far south as Hainan, extending, according to Schlegel (Mus. des Pays-Bas), to Borneo and Java.

574. **Numenius tahitiensis** (Gmel.); Swinh. P. Z. S. 1863, p. 318.

Numenius cyanopus, Vieill. 2nd ed. du Nouv. Dict. d'Hist. Nat. viii. p. 306.

Numenius major, Faun. Jap. (in part); Ibis, 1861, p. 343.

Numenius australis, Ibis, 1863, p. 97; P. Z. S. 1863, p. 318.

Numenius rufescens, Gould, P. Z. S. 1862, p. 286; B. of As. pl.; Ibis, 1863, p. 410 (summer); P. Z. S. 1863, p. 318.

Breeds in Amoorland; common near Pekin in August; found, during the season of migration, in Japan, Formosa, Moluccas, Australia, Tasmania, and the Society Islands. Not yet noticed on South-China coast.

575. IBIDORHYNCHUS STRUTHERSI, Vigors.

Ardea ——?, Ibis, 1861, p. 344.

"Frequents the banks of the most solitary fish-containing streams of the mountains near Pekin, where it sometimes breeds" (*David*).

576. IBIS PROPINQUA, Swinh. P. Z. S. 1870, p. 428.

Threskiornis melanocephalus?, P. Z. S. 1863, p. 318.

Talienwan; Canton river.

577. IBIS NIPPON, T. & S. Faun. Jap.; Ibis, 1863, p. 416, 1867, p. 413, 1870, p. 365; P. Z. S. 1863, p. 318.

China coast in winter, as far south as Hainan.

578. IBIS FALCINELLUS, L.

Seen on the lakes between Shanghai and Ningpo.

579. PLATALEA MAJOR, Temm. & Schl.; Ibis, 1863, p. 417, 1864, pp. 364, 370; P. Z. S. 1863, p. 319.

Platalea leucorodia, Ibis, 1860, p. 65, 1861, p. 344.

Formosa; Swatow.

580. TANTALUS LEUCOCEPHALUS, Gmel. Syst. Nat. i. p. 649.

Tantalus longimembris, Swinh. Ibis, 1867, pp. 227, 232.

Procured at Amoy.

581. LEPTOPTILUS JAVANICUS (Horsf.); Ibis, 1870, p. 364.

Hainan.

582. CICONIA ALBA, Linn.; P. Z. S. 1863, p. 319.

Père David saw it on one occasion, in November, at Takoo, mouth of the Peiho river.

583. CICONIA NIGRA, Linn.; Ibis, 1866, p. 401; P. Z. S. 1863, p. 319.

"Inhabits, in small numbers, the mountains near Pekin that yield streams containing fish; nests on the most inaccessible rocks" (*David*).

584. ARDEA CINEREA, L.; Ibis, 1860, p. 63, 1861, pp. 51, 343, 1863, p. 417, 1870, p. 365; P. Z. S. 1863, p. 319.

Throughout China, Hainan, and Formosa.

585. ARDEA PURPUREA, L.; P. Z. S. 1863, p. 319.

Hankow (Central China).

586. EGRETTA MODESTA (Gray).

Ardea modesta, J. E. Gray, Zool. Misc. p. 19; Ill. Ind. Zool. pl. 49.

Ardea syrmatophora, Gould, P. Z. S. 1846; B. of Austr. pl.

Ardea egretta?, Ibis, 1860, p. 64, 1861, p. 51.

Herodias alba, Ibis, 1863, p. 417, 1866, p. 295, 1867, p. 387, 1870, p. 365; P. Z. S. 1863, p. 319, 1870, p. 427.

Prof. Schlegel (Mus. des Pays-Bas) maintains that the *E. alba* of Europe is constantly of a larger form than the White Heron of Africa, Asia, and Australia; but he identifies the latter with the American White Heron, *A. egretta,* Gmel. (*leuce,* Illiger). I have compared an adult male from Canton with an adult male from America in Mr. Salvin's collection. The Chinese bird has a tarse $\frac{5}{8}$ inch longer than the American, but is otherwise of nearly similar proportions; it has a more compressed head, a black bill, and a considerably longer dorsal train. Mr. Salvin says that he has never heard of the American bird acquiring a black bill, and agrees with me in considering it distinct from the East-Asian bird. With the African *E. flavirostris,* Temm., I have not been able to make comparison. The European *E. alba,* like our bird, has the bill yellow in winter, black in summer, and would appear to be a larger edition of the same, in fact a larger conspecies. In the same way the Californian White Heron seems to be a larger conspecies of the *E. leuce* of South-eastern North America. There is no harm in recognizing them as species. Throughout China, Hainan, and Formosa.

587. EGRETTA INTERMEDIA (V. Hasselq.).

Herodias intermedia, Ibis, 1861, p. 344; P. Z. S. 1863, p. 319, 1870, p. 427.

Herodias egrettoides, Ibis, 1861, p. 261.

Bill yellow throughout the year, tipped with black. Canton; Hankow.

588. GARZETTA EGRETTA (Brisson).

Herodias garzetta, Ibis, 1860, pp. 64, 429, 1861, p. 52, 1862, p. 258, 1863, p. 417, 1870, p. 365; P. Z. S. 1863, p. 319, 1870, p. 427.

Southern China, Hainan, and Formosa.

589. GARZETTA EULOPHOTES.

Herodias eulophotes, Swinh. Ibis, 1860, p. 64, 1863, p. 418; P. Z. S. 1863, p. 320.

Amoy; North Formosa.

590. BUBULCUS COROMANDUS.

Buphus coromandus (Bodd.), Ibis, 1860, p. 64, 1861, p. 52, 1862, p. 258, 1863, p. 419, 1865, p. 234; P. Z. S. 1863, p. 320.

Summer visitant to South China and Formosa.

591. Butorides javanicus (Horsf.); Ibis, 1860, pp. 132, 358, 1861, p. 52; P. Z. S. 1863, p. 320.

Herodias asha, Ibis, 1860, p. 64.

Comes to South China in summer to breed.

592. Butorides macrorhynchus, Gould.

Butorides javanicus, Ibis, 1863, p. 420.

A larger bird than the last in all its proportions, but otherwise very similar. Common in Formosa in summer. I procured a male at Amoy on the 26th Aug. 1866. It is the species that visits Japan (Schleg. Mus. des Pays-Bas).

593. Ardeola prasinosceles, Swinh. Ibis, 1860, p. 64, 1861, p. 52, 1862, p. 258, 1863, p. 421 (errore), 1870, p. 365; P. Z. S. 1863, p. 319.

Resident in South China and westwards to Szechuen. Found as far south as Cochin China. In Siam and Malacca is replaced by the *A. malaccensis* (Gmel.), *A. bacchus*, Bp. I entered it in my Formosan list on insufficient evidence. It has not occurred on that island.

594. Nyctiardea nycticorax (L.).

Nycticorax griseus, Ibis, 1860, p. 358, 1861, pp. 53, 56, 344, 1863, p. 423, 1866, p. 293, 1870, p. 365; P. Z. S. 1863, p. 320.
Nycticorax manillensis?, Ibis, 1860, p. 65.

Resident throughout China and Formosa.

595. Goisachius melanolophus.

Ardea melanolopha, Raffles, Linn. Trans. vol. xiii. part 2, p. 326.
Ardea goisagi (Temm.), Pl. Col. 582; Faun. Jap. pl. 75; Ibis, 1865, p. 358, 1866, pp. 122, 403.
Nycticorax melanolophus, P. Z. S. 1863, p. 320.

Formosa. Procured also from Japan, the Philippines, Sumatra, Arracan, and Ceylon.

596. Botaurus stellaris, L.; Ibis, 1861, p. 410; P. Z. S. 1863, p. 320.

Throughout China.

597. Ardetta flavicollis (Lath.); Ibis, 1862, p. 258, 1863, p. 422; P. Z. S. 1863, p. 320.

Foochow and Hankow.

598. Ardetta cinnamomea (Gmel.); Ibis, 1860, p. 65, 1861, p. 53; 1862, p. 258, 1863, p. 422; P. Z. S. 1863, p. 320.

Throughout China and Formosa in summer.

599. ARDETTA SINENSIS (Gmel.); Ibis, 1860, p. 65, 1861, p. 53, 1862, p. 258, 1863, pp. 97, 422, 1867, p. 231; P. Z. S. 1862, p. 320, 1863, p. 321.

China in summer. Rare in Formosa.

600. PORPHYRIO CŒLESTIS, Swinh. Ibis, 1868, p. 59; P. Z. S. 1870, p. 428.

Porphyrio sp.?, Ibis, 1866, p. 298.
Canton; Amoy.

601. HYDROPHASIANUS CHIRURGUS (Scop.); Ibis, 1865, p. 541, 1866, p. 405.

Hydrophasianus sinensis, P. Z. S. 1863, p. 321.

Hankow; Amoy coast; Formosa. I watched a party of three immature birds on a pool in South Formosa in January. They float lightly on the water, like Phalaropes, but with the tail partly cocked. They rise heavily, and fly with long slow flaps, looking like small white-winged Herons. They alight boldly on the water, and permit close approach. When sitting they look dark and unnoticeable; but the wings once expanded they become conspicuous white objects. Iris chestnut; bill and legs light sea-green.

602. GALLICREX CRISTATA (Lath.); Ibis, 1861, pp. 56, 267, 411, 1863, p. 425, 1866, p. 297; P. Z. S. 1863, p. 321.

South China; westward to Szechuen; Formosa.

603. GALLINULA CHLOROPUS (L.); Ibis, 1861, p. 56, 1862, p. 307, 1863, p. 427; P. Z. S. 1863, p. 321.

Throughout China and Formosa.

604. GALLINULA PHŒNICURA (Penn.); Ibis, 1863, p. 427, 1870, p. 364; P. Z. S. 1863, p. 321.

Porzana phœnicura, Ibis, 1860, p. 67, 1861, p. 57.
South China; Formosa.

605. PORZANA ERYTHROTHORAX, Temm. & Schl.; Swinh. Ibis, 1861, pp. 57, 411.

Porzana fusca, Ibis, 1863, p. 426; P. Z. S. 1863, p. 321.

Prof. Schlegel (Mus. des Pays-Bas) recognizes this as distinct from *P. fusca* of India. Though variable in size and length of wing, it has longer toes; and the pectoral red does not extend so low down on the belly as in *P. fusca*. It is a close *conspecies* of the Indian bird.

606. PORZANA PYGMÆA (Naumann); P. Z. S. 1863, p. 321.

Gallinula bailloni, Vieill.

Porzana bailloni, Ibis, 1863, p. 97, 1867, p. 389; P. Z. S. 1862, p. 320.

Throughout China in summer. It strikes me that Pallas's name *minuta* must really apply to this bird, the Little Crake of Europe not being found so far eastwards as Dauria (*cf.* Pall. Zoogr. ii. p. 156).

607. RALLINA MANDARINA.

Porzana mandarina, Swinh. Ann. & Mag. N. H. vol. v. 4th series, p. 173; P. Z. S. 1870, p. 427.

Procured at Canton, in company with *P. erythrothorax*, by Mr. S. Bligh.

608. HYPOTÆNIDIA STRIATA.

Rallus striatus, L.; Ibis, 1863, p. 427, 1865, p. 234, 1866, p. 394; P. Z. S. 1863, p. 321.

Formosa; Canton (Schlegel, Mus. des Pays-Bas).

609. RALLUS INDICUS, Blyth, J. A. S. xviii. p. 820; Ibis, 1863, p. 97; P. Z. S. 1862, p. 320.

Rallus aquaticus, P. Z. S. 1863, p. 322.

The Asiatic representative of *R. aquaticus* of Europe, distinguishable by its dark facial streak from the base of the bill to beyond the eyes. Tientsin.

610. FULICA ATRA, L.; Ibis, 1861, p. 344, 1864, p. 370, 1865, p. 349, 1867, p. 397; P. Z. S. 1863, p. 322.

China; Formosa.

611. PODICEPS PHILIPPENSIS (Bonn.); Ibis, 1860, p. 67, 1870, p. 366.

Podiceps minor (Gmel.); Ibis, 1863, p. 433, 1865, p. 541; P. Z. S. 1863, p. 322.
Podiceps philippinus, Ibis, 1861, p. 343.
China; Formosa; Hainan.

612. PODICEPS AURITUS (L.); Ibis, 1860, p. 67, 1861, p. 344; P. Z. S. 1863, p. 322.

Amoy in winter.

613. PODICEPS CORNUTUS (Gmel.); P. Z. S. 1863, p. 322.

Colymbus cornutus, Gmel. Syst. Nat. i. p. 591.

Amoy in winter.

614. PODICEPS CRISTATUS (L.); Ibis, 1860, p. 67, 1861, p. 344; P. Z. S. 1863, p. 322.

Podiceps cornutus, Pall.

To the south coast, in winter, in large numbers.

615. COLYMBUS SEPTENTRIONALIS, L.; Ibis, 1863, p. 433; P. Z. S. 1863, p. 322.

Colymbus glacialis, Ibis, 1860, p. 67, 1861, pp. 268, 410, 345.
Common winter visitant to the south coast.

616. **MERGELLUS ALBELLUS** (L.); Ibis, 1861, p. 344; P. Z. S. 1863, p. 322.

North China. Common on the Yangtsze in winter.

617. **MERGUS SERRATOR**, L.; P. Z. S. 1863, p. 323.

Mergus serratus, Ibis, 1860, p. 67, 1861, p. 344.
Throughout China.

618. **MERGUS CASTOR**, L.

Mergus merganser, L.; Ibis, 1861, p. 344; P. Z. S. 1863, p. 323.
Comes down as low as Amoy in winter.

619. **MERGUS SQUAMATUS**, Gould, P. Z. S. 1864, p. 184.

China (*Gould*).

620. **CYGNUS MUSICUS**, Bechst.; Ibis, 1862, p. 254; P. Z. S. 1863, p. 323.

Shanghai market in winter.

621. **CYGNUS MINOR**, Pall. Zoogr. ii. p. 214; Ibis, 1861, p. 344, 1862, p. 254; Zoologist, 1860, p. 6924; P. Z. S. 1863, p. 323.

Cygnus bewickii, Yarr.; Ibis, 1867, p. 398.
Shanghai market in winter.

622. **CYGNUS DAVIDI**, Swinh. P. Z. S. 1870, p. 430.

Smaller than the last, with orange-red bill and legs. "Lores covered with small feathers" (*David*). The specimen on which this species is based is in the Pekin Museum, and was procured by Père David in the market at Tientsin.

623. **ANSER CYGNOIDES** (L.); Faun. Jap. pl.; Ibis, 1861, p. 344; P. Z. S. 1863, p. 323.

Common in the Shanghai market in the early part of winter.

624. **ANSER ALBIFRONS** (Gmel.); Ibis, 1861, p. 344; P. Z. S. 1863, p. 323.

Shanghai market in winter.

625. **ANSER ERYTHROPUS**, L.

Anser minutus, Naumann.

In the market at Kinkiang, on the Yangtsze, on the 16th March, 1869.

626. **ANSER CINEREUS**, Meyer, var. **RUBRIROSTRIS**.

Anser ferus, Swinh. Ibis, 1861, p. 344, 1862, p. 254; P. Z. S. 1863, p. 323, 1870, p. 427.
Anser rubrirostris, Hodgs.

Shanghai in winter. I have one shot at Canton by Mr. S. Bligh. It is of large form, with long and large bill, white on the frontal feathers at the base of the bill, of a pale colour with blotches of black on the underparts, and with very little grey on the wing-coverts and rump. The size of the bill varies greatly in English specimens; but the pale colour, comparative absence of grey, and white frontal edging to the bill seem characteristic of the Eastern race, and I think it as well to distinguish it as a variety.

627. ANSER SEGETUM, var. SERRIROSTRIS.

Anser segetum, Ibis, 1860, p. 67, 1861, p. 344, 1862, p. 253, 1867, p. 392; P. Z. S. 1863, p. 323.

Anser serrirostris, Gould, MS.

A Bean-Goose comes down in immense swarms every cold weather to the marshes, at the river's mouth, near Amoy. They are of large size, and peculiar in having huge bills approximating that of *A. grandis*. I have handled several, and they were all so distinguishable. I have brought home a male and compared it with a home-shot bird kindly lent me by Mr. Tristram. The Chinese bird has a paler cheek and throat, a much lighter and yellowish-brown neck, narrower white edges and tips to the tail-feathers, and longer tarsi; but in other respects it is similar. The British Museum has two specimens of this Goose from Trans-Baikal, and Mr. Gould a specimen from Shanghai. Mr. Gould's specimen is labelled *A. serrirostris*, a name he intended to publish in 1862. On the Wanchow river all the Geese shot by our party on the 10th of February were of this race.

628. ANAS BOSCHAS, L.; Ibis, 1861, p. 344, 1862, p. 254.

A winter Duck in South China.

629. ANAS ZONORHYNCHA, Swinh. Ibis, 1866, p. 394; P. Z. S. 1870, p. 427.

Anas pœcilorhyncha, Temm. & Schl. Faun. Jap. pl. lxxxii.

Throughout China. I believe it breeds in many parts, north and south. It is absurd, with our present experience, to imagine this bird a cross between *A. boschas* and *A. pœcilorhyncha* of India. It is a very common Duck at Shanghai, and I have seen many specimens. *A. pœcilorhyncha* does not occur with us; and can we suppose that India would originate a bird to disperse throughout more Eastern Asia, and not reserve any of the hybrids for herself? Our bird (male) has a narrower yellow nib to the bill, and no basal yellow. It has a distinct white supercilium; throat unspeckled white; alar speculum deep blue, slightly tinged with green; lesser coverts, overlapping the speculum, brown, tipped with black with no white; tertials only slightly margined with white; rump, upper tail-coverts, and tail deep blackish brown, without any bronze reflections; crown, streak through the eye, and short moustache-streak deep brown; cheeks and neck brownish white, with brown specks; breast light yellowish brown, with deep-brown spots; rest of underparts deep brown, becoming nearly black on the under tail-coverts;

axillaries pure white. Size about that of *A. pœcilorhyncha*. The female is smaller than the male, and has the blotched yellowish of the breast extending to the abdomen. In *A. pœcilorhyncha* the breast and belly are nearly white, covered with round brown spots. The speculum of our bird is greener in some specimens; and some show a little white on the overlapping wing-coverts in rear of their black tips, and have more or less white on the outer webs of the tertials.

630. TADORNA CORNUTA (Gmel.).

Tadorna vulpanser, Flem.; Ibis, 1861, p. 344, 1862, p. 254.
Anas cornuta, S. G. Gmel. It. ii. p. 185.
China coast in winter.

631. CASARCA RUTILA (Pall.); Ibis, 1861, p. 344, 1862, p. 254.

Common, in winter, on inland waters; rare on the coast.

632. SPATULA CLYPEATA (L.).

Rhynchaspis clypeata, Swinh. Ibis, 1861, p. 57, 1862, p. 254, 1867, p. 388.

Abundant in South China and Formosa in winter.

633. DAFILA ACUTA (L.); Ibis, 1861, p. 345, 1867, p. 399.

China and Formosa in winter.

634. MARECA PENELOPE, L.; Ibis, 1861, p. 345, 1867, p. 399, 1870, p. 366.

Abundant in South China and Formosa in winter.

635. CHAULELASMUS STREPERUS (L.).

Procurable in the Shanghai market in winter, but rare.

636. QUERQUEDULA CRECCA (L.); Ibis, 1861, p. 345, 1865, p. 347, 1867, p. 399, 1870, p. 366.

Abundant everywhere in China and Formosa during winter. This species, the Wigeon, and the Shoveller are the commonest winter Ducks in South Formosa.

637. QUERQUEDULA CIRCIA (L.); Ibis, 1863, p. 434, 1867, p. 407; P. Z. S. 1870, p. 427.

Probably breeds in South China, but is rare. Has occurred also in Formosa.

638. AIX GALERICULATA (L.); Ibis, 1866, p. 295; P. Z. S. 1863, p. 324.

I think, throughout China, breeding in many localities. Found also resident in the interior of Formosa.

639. EUNETTA FORMOSA (Georgi); Ibis, 1867, p. 394.

Anas glocitans, Pall.; Ibis, 1861, p. 344, 1867, p. 231, 409.
Abundant throughout China in winter.

640. Eunetta falcata (Pall.).

Anas falcaria, Lath.; Ibis, 1861, p. 345, 1862, p. 254.

Querquedula multicolor, Ibis, 1860, p. 67.

Throughout China in winter. Middendorff figures a young male for the female (Sib. Reise, t. xxi.). The female is coloured more as the female of *A. boschas*, with just a glow of pink on its cheeks.

641. Œdemia fusca (L.).

Very abundant in the Shanghai market.

642. Œdemia americana (Richardson); Ibis, 1863, p. 435; P. Z. S. 1863, p. 324.

Shot on the Yangtsze by Capt. Blakiston. I have sought in vain in the Shanghai market for both this and the true *Œ. nigra* (L.).

643. Bucephala clangula (L.).

Clangula glaucion, Ibis, 1861, p. 345.

I have procured this in winter as far south as Amoy. Common at Shanghai.

644. Harelda glacialis (L.).

Père David received a specimen of this shot at Takoo, mouth of the Peiho river.

645. Aythya ferina (L.).

Shanghai market in winter.

646. Fulix marila (L.); Ibis, 1861, p. 345, 1862, p. 254.

Down the China and Formosan coasts in winter.

647. Fulix cristata (L.); Ibis, 1861, p. 345, 1862, p. 254, 1867, p. 399.

Comes with the last.

648. Fulix baeri, Radde, Reise im Süden von Ost-Sib. 1855–59, p. 376, t. xv.

On my cruise up the river Yangtsze we stopped at Kinkiang for a day and a half; and I was fortunate enough to procure an adult male of this species. It was being hawked about in the streets. My specimen answers precisely to Radde's description and figure, and looks very much like a cross between *Anas boschas* and *Fulix cristata*, having somewhat the head and breast of the former and the body of the latter. But mine is too exact a copy of Radde's type, which he procured from a party of four of the same, to admit of being considered a hybrid. Bill French grey. Irides light yellow. Legs patched with grey and black. Head and neck black, reflecting deep green; breast deep chestnut; upper parts, wings, and tail deep brown; greater wing-coverts white, tipped with bronzed brown; tertiaries deep bronzed brown, the foremost edged with black; primaries brownish white on their inner webs; large loose feathers on the sides of the rump light reddish brown; abdomen splashed with brown.

649. PHALACROCORAX CARBO (L.); Ibis, 1860, p. 68, 1861, pp. 261, 345, 1863, p. 433, 1867, p. 390, 1870, p. 367; P. Z. S. 1863, p. 324.

Phalacrocorax filamentosus, Ibis, 1861, pp. 264, 409.
Phalacrocorax capillatus, P. Z. S. 1863, p. 325.

Throughout China and Formosa; in the south only during the winter.

650. GRACULUS BICRISTATUS (Pall.), Ibis, 1861, pp. 408, 410, 1863, p. 434; P. Z. S. 1863, p. 325.

Phalacrocorax æolus, Ibis, 1867, p. 395.

Occurs in winter on the China coast.

651. PELECANUS MITRATUS, Licht. Abh. Ak. Wiss. Berl. 1838, t. 32; P. Z. S. 1868, p. 266, fig. 3.

Pelecanus minor, P. Z. S. 1870, p. 428.
Pelecanus onocrotalus, Ibis, 1865, p. 352; P. Z. S. 1863, p. 325.

I have a specimen from Foochow.

652. PELECANUS PHILIPPENSIS (Gm.).

Pelecanus philippensis, Swinh. Ibis, 1865, p. 111, 1866, p. 297; P. Z. S. 1863, p. 325.
Pelecanus crispus, Ibis, 1860, p. 68, 1862, p. 254.

Amoy.

653. SULA FIBER (L.).

Sula fusca, Briss.; Ibis, 1870, p. 367; P. Z. S. 1863, p. 325.
Sula sinicadvena, Ibis, 1865, p. 109.

Formosa; Shanghai.

654. LARUS NIVEUS, Pall.; Bp. Consp. Av. ii. p. 224; Ibis, 1863, p. 428, 1870, p. 366; P. Z. S. 1863, p. 325.

Larus canus, var. *major*, Midd. Sib. Reise; P. Z. S. 1861, p. 272.
Larus canus, Ibis, 1860, p. 68, 1861, p. 345.

Like the following, but with stronger bill and longer tarse and toes. Visits Amoy harbour in the coldest weather, usually in immature plumage.

655. LARUS CANUS, L.

Much commoner than the last in Amoy harbour in winter, and often in fine adult plumage. Probably breeds in more southerly latitudes than its ally.

656. LARUS CRASSIROSTRIS, Vieill.; Ibis, 1863, p. 428; P. Z. S. 1863, p. 326.

Larus melanurus, T. & S. Faun. Jap.; Ibis, 1860, p. 133, 1861, pp. 261, 345.

Larus fuscus, Ibis, 1860, p. 68.

A common winter Gull on the South-China coast.

657. LARUS CACHINNANS, Pall.; Ibis, 1863, p. 428, 1870, p. 366; P. Z. S. 1863, p. 327.

Larus argentatus, var. *cachinnans*, V. Schrenck, Reise Amur., Vög. p. 504.

Larus borealis, Bruch *nec* Brandt.

Larus argentatus, Ibis, 1861, p. 345.

China coast in winter. Rather larger than *L. argentatus*, with a deeper-coloured mantle.

658. LARUS OCCIDENTALIS, Aud.; P. Z. S. 1863, p. 326.

Larus borealis, Brandt.

A winter visitant to the China coast. Like *L. argentatus*, but of very large size.

659. CHROICOCEPHALUS BRUNNEICEPHALUS, Jerdon.

Received at the Paris Museum from Pekin (*J. Verreaux*).

660. CHROICOCEPHALUS RIDIBUNDUS (L.); Ibis, 1863, p. 428.

Chroicocephalus capistratus, P. Z. S. 1863, p. 327.

Macao; Amoy. Rare winter visitant to South China.

661. CHROICOCEPHALUS SAUNDERSI, Swinhoe. See *anteà*, p. 273, Pl. XXII.

662. SYLOCHELIDON CASPIA (Pall,); P. Z. S. 1863, p. 328.

Sterna caspia, Pall.; Ibis, 1860, p. 68, 1861, p. 345, 1863, p. 430, 1870, p. 366.

Sterna melanotis, Swainson (winter dress).

China generally.

663. HYDROCHELIDON HYBRIDA (Pall.).

Hydrochelidon indica (Steph.); Ibis, 1863, p. 428; P. Z. S. 1863, p. 328.

Sterna leucopareia, Natterer.

Formosa. Not observed yet in China.

664. HYDROCHELIDON NIGRA (L.); Ibis, 1863, p. 97; P. Z. S. 1863, p. 328.

Hydrochelidon javanica, Ibis, 1860, p. 68, 1861, p. 345.

Throughout China.

665. **Thalasseus pelecanoides** (King); Schleg. Mus. des Pays-Bas.

Thalasseus cristatus, P. Z. S. 1863, p. 329.
Sterna cristata, Ibis, 1860, p. 68, 1863, p. 430.
Sterna velox, Ibis, 1860, p. 429, 1861, p. 345, 1866, p. 134.
South China; Formosa, breeds on the islands off its north end.

666. **Haliplana anæthета** (Scop.).

Sterna panayensis, Gmel. Syst. Nat. 1788, i. p. 607.
Common about the Pescadore Islands.

667. **Sterna hirundo**, L.; P. Z. S. 1863, p. 329.

Hankow; Pekin.

668. **Onychoprion melanauchen** (Temm.); Ibis, 1867, p. 230, 1870, p. 367.

Sterna minuta?, Ibis, 1860, p. 429.
Common about the rocks outside Amoy Harbour, where they breed.

669. **Sternula minuta** (L.); Ibis, 1863, p. 430; P. Z. S. 1863, p. 329.

Sternula sinensis (Gmel.); Ibis, 1863, p. 429; P. Z. S. 1863, p. 329.
Sterna minuta, Ibis, 1860, p. 68, 1861, p. 345, 1862, p. 307.
Formosa; China. Breeds on the east coast of Formosa.

670. **Gygis alba** (Sparrm.).

Sterna candida, Gmel. Syst. Nat. i. p. 607; Ibis, 1864, p. 423.
Seen near the Paracel Shoals in the South-China sea.

671. **Anous stolidus** (L.); Ibis, 1860, p. 429, 1863, p. 430, 1864, p. 422; P. Z. S. 1863, p. 329.

Anous pileatus, North China Asiat. Soc. Journal, May 1859; Ibis, 1869, p. 360.
North-east Formosa, where it breeds.

672. **Thalassidroma monorhis**, Swinh. Ibis, 1867, p. 386.

Amoy. Breeding on the small islands north-east of Formosa (*Collingwood*).

673. **Diomedea albatrus**, Pall. Zoogr. ii. p. 308; Ibis, 1864, p. 423.

Diomedea brachyura, Temm.; Ibis, 1860, p. 67, 1863, p. 431, 1867, p. 226, 1870, p. 366; P. Z. S. 1863, p. 329.
China Sea.

674. **Diomedea nigripes**, Audubon; Ibis, 1863, p. 431; P. Z. S. 1863, p. 329.

Diomedea fulginosa, Ibis, 1860, p. 68.
China Sea.

675. Attagen minor (Gmel.).

Pelecanus minor, Gmel. Syst. Nat. 1788, i. p. 572.
Tachypetes minor, Ibis, 1868, p. 56.
Paracel Shoals. One shot at Amoy.

Note.—In the Chinese Materia Medica (called 'Pun Tsao Kang Muh') I find in the figure of the Fe-seng, or "Flying Beast," a remarkable likeness to the fossil *Archæopteryx* described by Prof. Owen. I will investigate this question on my present return to China. —*R. S.*

2. Description of a new Genus of Newts from Western Yunan. By John Anderson, M.D., Curator of the Indian Museum, and Professor of Comparative Anatomy, Calcutta.

[Received April 17, 1871.]

Tylototriton*, n. g.

Head flat, surrounded by a prominent osseous ridge, with a short longitudinal ridge along the vertex. The bony orbit above the eye similar to that of *Cynops*, *Pleurodeles*, *Euproctus*, and *Notophthalmus*. Parotoids large, auriculoid, flattened from above downwards. Along the body a lateral line of equidistant, large, rounded, knob-like, porous, glandular tubercles, terminating at the root of the tail. The second to the fifth epipleural processes and the extremities of the remaining ribs terminate in the knob-like lateral glands. A broad porous vertebral ridge corresponding to the enlarged crests of the dorsal and sacral vertebræ. An obscure line of pores between the axilla and the groin, and a series of larger ones on the head. Skin finely tubercular. Tail as long as the body, laterally compressed, with sharp lower and upper margins. Limbs well developed. Fingers four, toes five. Palatine teeth begin on a line with the internal nostrils, in two ridges meeting in front, but widely divergent behind. Maxillary teeth small, acute, on the inner edge of the jaw. Tongue of moderate size, suborbicular, adherent, and slightly free at the edges. Vertebræ 46. Ribs 16: 13 dorsal, 1 sacral, 2 caudal.

Tylototriton verrucosus, n. sp.

The lateral cranial ridge subtriangular; the median ridge running backwards from the inside of the apex of the triangle, but not reaching so far posteriorly as the lateral ridge, the extremities of which curve inwards like a scroll in front of the parotoids. The parotoids slightly concave above, and somewhat resembling the outline of an upturned human ear. The nostrils close to the extremity of the rounded snout, but with a considerable interval between them,

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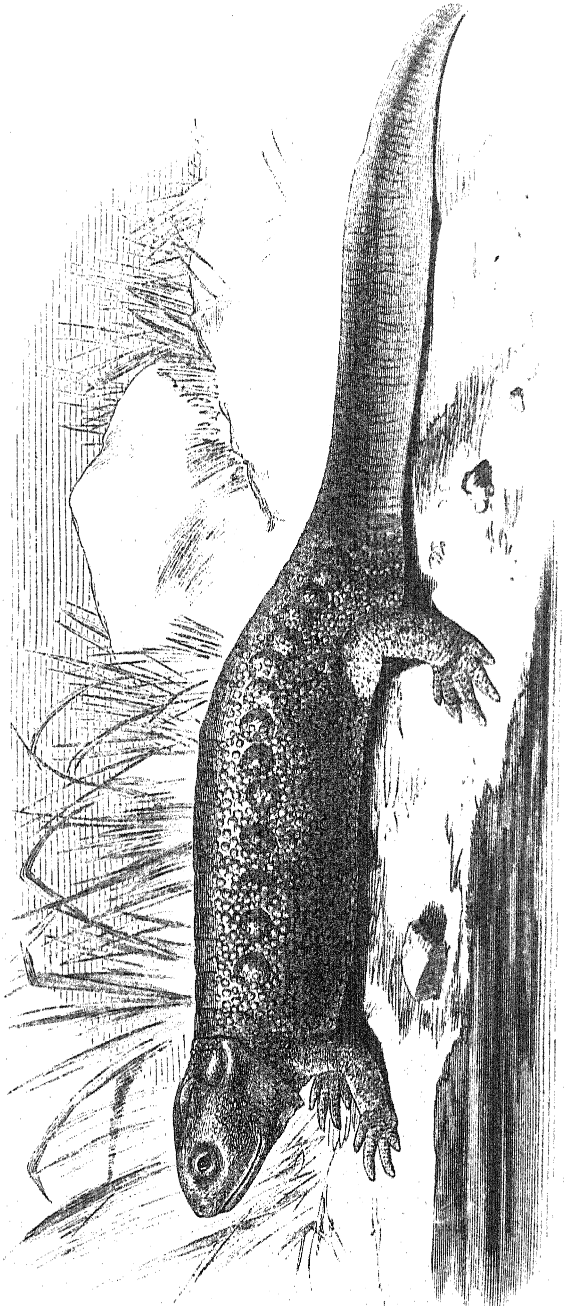
* τυλωτός, knobbed.



Tylototriton verrucosus.

semicircular, closed by a small valvular flap of skin. Eye of moderate size; upper eyelid large, granular. Fifteen knob-like glands along the side of the body: the first a short distance behind and about the axilla and on a level with the parotoids; the last three behind the leg when it is extended at right angles to the body. The vertebral glandular ridge begins on a line with the scroll-like extremities of the cranial crest, and terminates at the root of the tail. An obscure line of pores, larger than those of the rest of the body, from below the arm to the groin, rather towards the under surface of the side. A series of pores behind the angle of the mouth along the lateral cranial ridge to the top of the snout, on the loreal region behind the eye, and along the mandible and internal to it. The chin and throat thickly covered with small, smooth, porous, glandular tubercles of nearly uniform size. The sides and upper parts of the body and of the tail are densely covered with glandular tubercles (porous) of various sizes and irregularly distributed. The ventral surface transversely wrinkled and covered with very minute porous glands, which scarcely project above the level of the skin. The upper margin of the tail sharp, and commencing with the last lateral knob. Under surface rather rounded. Numerous folds on the inner margin of the vent. Forearms extend the length of the fingers beyond the snout; the legs reach halfway to the axilla.

Uniform blackish brown, paler on the lips, snout, chin, throat, and under surface of the limbs, all of which are of a brownish-olive tinge. Under surface of the tail dull orange-yellow, fading to lightish brown on the sides.

Length from tip of snout to vent 3 to 4 inches; vent to tip of tail 3 to $3\frac{3}{12}$ inches.

Hab. Nantin, Momien, and Hotha valleys, Western Yunan, China.

I first met with this remarkable Newt in the flooded rice-fields about the little Chinese town of Nantin, where, however, it was not very common. In the more elevated and subtemperate valley of Momien, at about a height of nearly 5000 feet above the sea, and in the high sequestered valley of Hotha (5000 feet) it was far from uncommon.

3. Note on *Testudo phayrei*, Blyth.

By JOHN ANDERSON, M.D.

[Received April 27, 1871.]

With reference to the correspondence between Drs. Gray and Sclater, which appeared in the 'Athenæum' of November and December last*, on the statements of Mr. Theobald regarding Dr. Gray's *Scapia falconeri* and Blyth's *Testudo phayrei*, I am in a position to state, after a careful examination of the type of *T. phayrei* in this museum, that it is a true *Testudo*. I enclose two drawings, one of the sternum (fig. 1) and another of the carapax (fig. 2) of the typical specimen, and a sketch of the sternum of the imperfect specimen on which Mr. Theobald grounded his remarks; and these drawings will prove that I am correct in referring the species to the genus *Testudo*.

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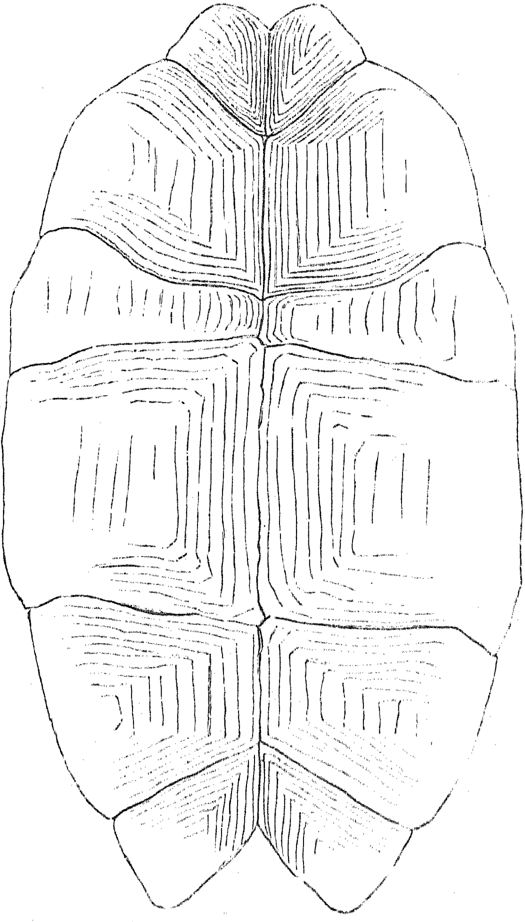
* See 'Athenæum,' Nov. 12th, 1870, Nov. 26th, 1870, Dec. 3rd, 1870, and Dec. 10th, 1870.

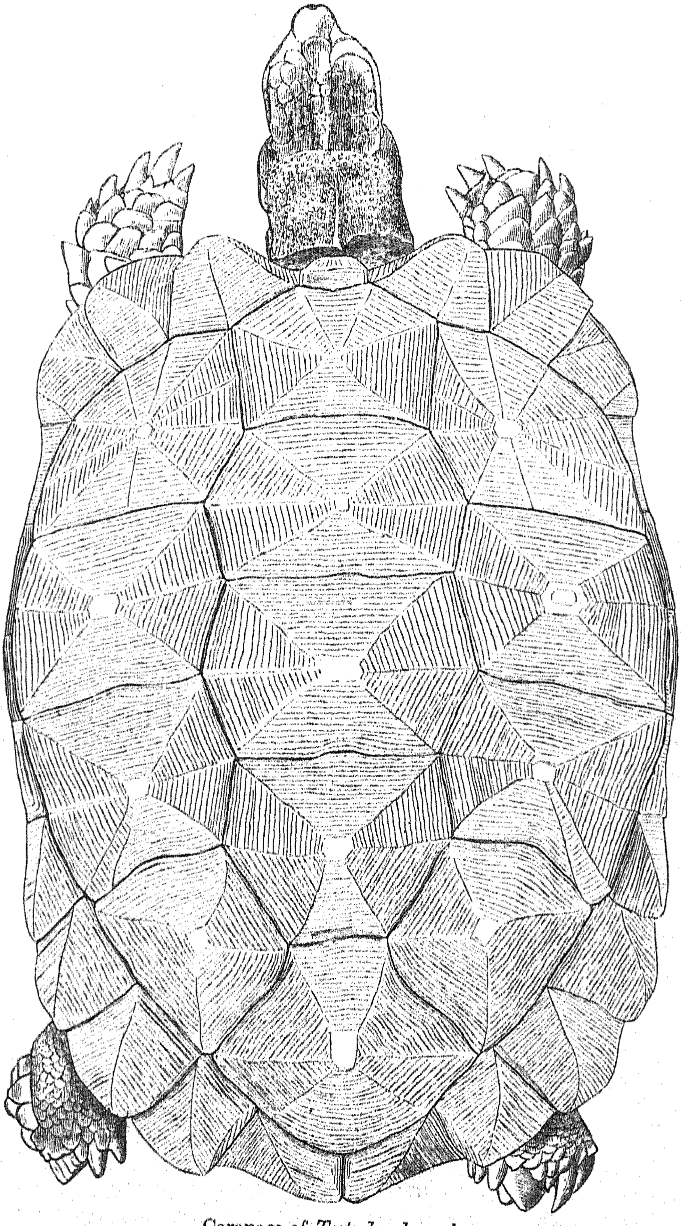
Fig. 1.



Sternum of *Testudo phayrei*.

With regard to Blyth's type of *T. phayrei*, I may mention that it is still in this museum, in a perfect state, and that it was referred

Fig. 2.



Carapace of *Testudo phayrei*.

by Theobald to *T. indica*. I am enabled to make this identification because Blyth has given such accurate measurements and descriptions of this specimen that it is impossible to mistake it for any other species. In describing the type he refers to another specimen smaller than it and having the appearance of great age, with most of the plates of its carapace more or less completely united, so that the form of some of them cannot be traced. This is the specimen referred by Theobald to *Manouria emys* in his catalogue, and is the one bearing the names of the sternal plates in the handwriting of Dr. Falconer. This specimen can hardly be said to be in fragments, as the carapace is entire with the exception of a small portion which has been broken off the anterior margin. The sternum, also, is nearly perfect, as shown in my drawing, although it wants the dermal plates. The skull and the remainder of the skeleton, however, are absent. It is interesting to observe that all the dermal plates, with the exception of those which Blyth described as being more or less completely united, have disappeared, and that these seem to have remained adherent to the carapace, owing to their being united into a mass which retained a firm hold of it. In connexion with this disappearance of the dermal plates, I would also observe that this specimen generally has a decided appearance of having been partially macerated, but not to any great extent.

It is evident, from what I have stated regarding the notes in his own handwriting on this specimen, that it had been in the possession of Dr. Falconer. The explanation appears to be that Mr. Blyth gave Dr. Falconer the less valuable specimen for his observations. Having seen the disputed skull in London, my impression is that it is that of *T. phayrei*, and that Mr. Theobald's account of its history is strictly accurate.

The type is a stuffed specimen and in capital condition. Like the other stuffed Tortoises in this museum, however, no wires were employed in mounting it, so that the circumstance that the skull of so-called *Scapia falconeri* has no wire-holes does not indicate much.

4. Notes on the Species of *Bradypodidæ* in the British Museum. By Dr. J. E. Gray, F.R.S. &c.

[Received April 6, 1871.]

(Plates XXXV.–XXXVII.)

Having received various specimens of this family in the British Museum from Mr. Carmiol, from Costa Rica, as the type of Dr. Peters's new species *Cholœpus hoffmanni*, and specimens of *Arctopithecus* from the Cordillera del Chucu, Veragua, in Costa Rica, and from Dr. Seemann from Nicaragua and from other parts of South America, I have been induced to compare them and to send to the Society the following notes as a result of my observations. Dr. Seemann and

Mr. Janson, junior, both inquired of me if I knew any green species of Sloth, for that was the colour of the living species in Nicaragua. There seems a tendency, according to the examination of the dried skins, in several of the species to be more or less tinted with this very unusual colour among Mammalia; and the colour seems to fade in the preserved skin; for the skin of the three-toed Sloth, which Dr. Seemann brought with him and said was quite green when alive, is only green on the sides, which have been covered by the arms and consequently less exposed than the other parts of the body. In one of the specimens of the *Unan* or two-toed Sloth, the long hair of the back of the head is whitish, and more or less dark green in a great part of its length, looking as if it had been all bright dark-green when it was alive.

Unfortunately a few only of the specimens in the Museum, those more lately received, have their special habitat. The rest were received from the Zoological Society or the Haslar Hospital, or have been purchased of dealers, and have only had the habitat of South America attached to them.

I have received the following interesting letter from Dr. Seemann:—

"Dear Sir,—The Sloth (*Arctopithecus*) I brought home was caught in the woods surrounding the Javali gold-mine in the Chontales district of Nicaragua, about 2000 feet above the sea-level, a country having nine months of rain during the year. The natives call this animal 'Camaleon,' and say that it is very rare, which may be the case, as during all my travels in the country I have never met with it before. But, on the other hand, it should be borne in mind that it has almost exactly the same greyish-green colour as *Tillandsia usneoides*, the so-called 'vegetable horsehair' common in the district; and if it could be shown that it frequented trees covered with that plant (a point I hope to ascertain during my next visit in June next), there would be a curious case of mimicry between this Sloth's hair and the *Tillandsia*, and a good reason why so few of these Sloths are seen. When the animal first came into my possession it was much *greener* than its preserved skin is now, which has been dried over the fire, and it remains to be seen whether the greenness is owing, at least in part, to the fact that the hair becomes covered with minute cryptogamic organisms, the damp climate and thick gloomy forests being favourable to their growth. I had no microscope with me to clear up this point; but this you will, of course, easily ascertain. I had the animal alive for about a month, feeding it on the young leaves of *Cecropia peltata*, an urticaceous fast-growing tree of the district; and it used to eat most during the night, when it was also most lively. One night it escaped from its prison, and next morning was found about 800 yards off, in a water-but, whither it had to make its way over a cleared hill, where there were no shrubs nor trees, which rather puzzled me. During my temporary absence from Javali the servants neglected to feed it, or else I had hoped to bring it to London, to present it to Dr. Sclater. It had great strength; and in order to pull it away from the tree to which it was holding, your hands were necessary. On those occasions it used to utter a shrill sound, like a Monkey; but I have never, on any other occasion, heard it uttering this sound.

"Hoping that some of these notes may be of service to you,

"I remain, &c.,

"BERTHOLD SEEMANN.

"4 Westminster Chambers, Victoria Street,
"April 1, 1871."

In this paper I have adopted the three genera proposed by me in the paper on the Skulls of the Family in the Proc. Zool. Soc. 1849, and the nomenclature used in the 'Catalogue of Carnivorous, Pachydermatous, and Edentate Mammalia in the British Museum,' 1869, p. 362.

Tribe I. CHOLŒPINA.

The hands with two claws, the feet three-clawed. Skull large, ventricose; front edge of the lower jaw much produced, into a spoon-like central lobe. Intermaxillary bones well developed, forming an arched edge to the front of the upper jaw. The front grinders in each jaw elongate, acute, working against each other like the canines of a Boar, the upper one being over the front of the lower one, and separated from the other grinders by a considerable vacant space. The angle of the lower jaw is thick, rounded, and only slightly produced, scarcely exceeding the back edge of the condyle; the front upper grinder placed quite close to the front end of the bone, and at a distance from the other teeth, which is the largest tooth. It is well developed and of a triangular shape in the skulls of very young animals, and separated from the other grinders by a considerable space in both jaws. It becomes much developed by age; and a large cavity is formed behind the tooth in the upper jaw for the reception of the one in the lower jaw. The malar bone short, triangular, and dilated at the end, with a short, narrow, horizontal upper process, and a broad or descending one.

In the young skull the nasal bone is small, elongate, triangular, projecting in front of the suture of the frontals. This bone is well figured in Rapp's 'Edentata,' t. iii. f. 2, 3, and is to be seen more or less distinctly anchylosed in some of the adult skulls; and the anterior process on the lower jaw is narrow. The intermaxillaries are separated from the maxillæ and from each other by narrow sutures, which are obliterated in the adults. The malar bone is elongate, produced horizontally, with a short upper rounded process and a much larger acute angular process, which is obliquely produced posteriorly. The skulls of the young specimens showing the sutures are as short and broad as in the more adult ones, except in one case (736*c*), where it is not above two-thirds the width; but only the front part of the jaws exist of this specimen, while there are two or three of different ages showing the sutures.

A very young skull, with a broad nose showing all the sutures, and having the nasal bone well produced, is figured by Rapp in his 'Edentata,' t. iii. f. 2, 3, as *Bradypus didactylus*.

The temporal muscles occupy a very different space in the series of skulls. In five of them (736*b*, young, 736*a*, 607, 910, and 736*d*) they are separated from each other by a space of considerable width. This space is much narrower behind in 1510*e*, which is a much older skull than any of the others. In three skulls (1510*a*, 1510) from Costa Rica, both of which are young, the temporal muscles are only separated by a very narrow ridge for about half or three-quarters of an inch; in an adult skull, that wants its hinder part (1510), they appear to approximate much further forward, but the occipital part of the skull is deficient.

The malar bones are very different in shape in the different specimens: in some the descending bone is very broad and fan-like, and in others it is comparatively small; the ascending one varies much in length, but is generally short, not reaching the zygomatic process and squamosal; but in one specimen from Costa Rica it nearly reaches the process, to which it is united by a cartilage.

There is a great difference in size, shape, and vesicularity of the pterygoids, and also in the substance, some being very thin and others thick and hard.

1. CHOLŒPUS.

1. CHOLŒPUS DIDACTYLUS, Gray, P. Z. S. 1849, p. 65; Catalogue, p. 363; Wagn. Suppl. vol. iv. p. 158.

One, which is generally dark, has the end of the hairs of the occipital crest white, and more or less tinted with bright green.

A young specimen received from Mr. Salvin is covered with short woolly hair, of a dark brown colour, rather paler on the rump, much paler on the head, the cheeks and chin, the band across the nose, and the orbits being dark brown.

All these specimens have pale, whitish claws, while the claws of the other species are of a dark brown or blackish colour.

Dr. Peters says the *C. didactylus* has long and *C. hoffmanni* short claws, but I cannot see any difference in the length of the claws in the Museum specimens of the two species. The claws are short in the young specimens, and become longer as they increase in age.

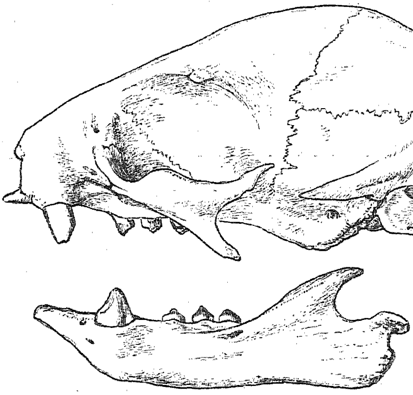
There is an adult specimen in the British Museum, presented by Captain Kellett, of H.M.S. 'Herald,' without any special habitat, which agrees with Mr. Salvin's specimens in having very long hair and white claws, but is of a nearly uniform dark brown colour, rather paler on the head, and redder beneath. The hair of the middle of the back and of the cervical crest has more or less long white tips; and these tips of the hairs of the cervical crest have a decided green tint.

The specimens of this genus appear to be very variable in colour and in length of hair.

A specimen said to have come from Juan de Fuca, received from the Haslar Hospital, has short hair of nearly uniform length, and is of a uniform dark brown colour, with scarcely any indication of an occipital crest.

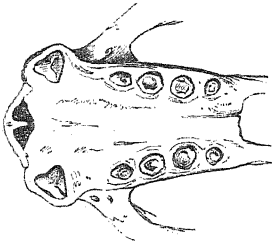
Two specimens from Brazil are like the former; but the hairs are longer, and the colour is rather paler, and there is a more decided nuchal crest.

Fig. 1.



Skull of *Cholœpus didactylus.*

Fig. 2.



Palate of *Cholœpus didactylus.*

Var. *columbianus.*

A specimen in the Museum, purchased of M. Parzudaki as coming from Columbia, is of a pale whitey-brown paper colour, darker at the root of the hairs, and has pale horn-coloured claws. I believe it is a pale variety of *C. didactylus,* differing in being of a pale colour and having longer hairs; but, like the hairs of that species, they lay regularly and form a uniform fur, whereas the hairs in *C. hoffmanni* are irregularly disposed and scattered in all directions, forming a very rough flaccid long fur. It may be designated, until we have the power of examining more specimens and comparing its bones with other species, *C. didactylus,* var. *columbianus.*

2. CHOLŒPUS HOFFMANNI, Peters; Gray, Cat. of Edentates Brit. Mus. p. 363.

A specimen sent by Dr. Peters as a type of this species, and another specimen purchased of Mr. Carmiol, from Costa Rica, as a typical specimen, have very long hair of a nearly uniform pale brown colour, more or less white at the tips; and they have a very long full nuchal crest and a white face, showing distinctly a brown band across the nose extending to a ring round each eye.

The limbs of these specimens are of a darker brown colour.

There is in the Museum a series of skins apparently belonging to this animal, which were obtained by Mr. Salvin in Costa Rica. They are all peculiar for the length and abundance of their hair; in one the upper part of the body is dark with short white tips to the hair.

Dr. Peters, when he described *Cholœpus hoffmanni*, discovered that it had only six cervical vertebræ, the skeletons of *C. didactylus* seven; thus he proved that what had been considered an abnormal form by some, and a mistake in the describer or preparer of the specimen by others, was in reality a normal condition of two distinct species, which had been erroneously considered to be the same.

We have several skulls (namely the front part of a skull of a very young animal, and four skulls of adult animals) in the British Museum, belonging to this genus.

The width of the nose in the young skulls is exceedingly different, in the imperfect one the nose being only two-thirds; and the front process of the lower jaw is much narrower in the imperfect skull than in the other. They probably belong to two species,—the imperfect one being probably *C. didactylus*, and the more perfect one *C. hoffmanni*, as I observed that the process of the lower jaw of *C. hoffmanni* is broader than in the one said to be from the typical specimen of *C. hoffmanni*; but I do not observe the same difference in the width of the nose. The perfect young skull (*736 b*) is very convex above.

The adult skulls are of two very different forms.

Two of them are very broad, slightly convex, crown flattened behind towards the occiput and expanded over the hinder orbital prominence, which is broadly produced. They are considerably wider in this part than the skulls of the other form. The process of the lower jaw slightly tapers on the side to a rather pointed end. The two others are very convex and gradually arched above, narrowed and shelving towards the occiput, and regularly shelving down over the hinder orbital process, which is acute. The prominence of the lower jaw is broad with nearly parallel sides and rounded at the end.

The noses of the two varieties are nearly of the same width; but the one with the flattened crown has the nose more flattened above, and the other is more evenly convex and shelving on the sides.

I cannot decide if these characters are those of two distinct species, or characters of the two sexes. I should have decided in favour of the former hypothesis; but the two skulls which we have extracted from the skins which were sent to us as the skins of *C. hoffmanni* present both varieties.

The hinder openings of the nostrils and the groove between the pterygoids are in the one with the flattened crown very different from those in the other specimen: the groove is wider in front near the internal nostrils, in the other the groove is narrow and the opening of the internal nostrils much more constricted; but one of the skulls with the arched forehead (1510 *e*), received from Capt. Kellett, has the grooves of the pterygoids much wider than in the others, and rather contracted instead of dilated in front at the opening of the nostrils.

a. Crown flattened, broad. *Bradypus didactylus*, Blainville's Osteog. t. iii. fig. (skull, adult and young).

Skull (736 *a*), adult. Columbia.

Skull (736 *b*), young. *B. didactylus*, Rapp, Edentata, t. iii. fig. 2, 3.

Skull with the nose very deformed. *Cholœpus hoffmanni*. Veragua.

b. Crown arched longitudinally and transversely.

Skull adult (736 *d*). Ecuador.

Skull adult (1510 *e*). *Cholœpus hoffmanni*, Capt. Kellett, is peculiar for having the nasal bone prominent beyond the edge of the nose and thoroughly anchylosed to the other bones.

c. Skull very young. Nose only preserved, narrower than the rest. No. 736 *c*.

The skull from the very adult skeleton (1510 *b*) appears to belong to this variety; but the flatness of the hinder part of the crown renders it intermediate between the two. It has a very broad canal between the pterygoids, like the skeleton (1510 *e*); and the pterygoids of these two skulls are not nearly so vesicular as in the other specimens.

d. There are three skulls of young animals, one received from Dr. Peters from Costa Rica as *Cholœpus hoffmanni*, and two received from Costa Rica by Mr. Salvin.

They are all peculiar for having the scars of the temporal occupying the whole of the hinder part of the skull, and only separated from each other by a narrow ridge. The oldest of the three (1510 *e*) has a rounded convex forehead and a narrow groove between the pterygoids, which are dilated in front, and a small distinct nasal. The next in age (1510 *a*), received from Dr. Peters, has a broad more flattened forehead; and the smaller one, from Mr. Salvin (1510 *d*), has a still more flattened forehead; these two have a very broad groove between the pterygoids, narrowed in front; in fact the skulls of the species of *Cholœpus* are exceedingly variable in external characters in specimens from the same locality.

Tribe II. BRADYPODINA.

Hands and feet three-clawed. Skull oblong. Front end of the lower jaw truncated, without any or only a very short anterior spoon-like lobe. Intermaxillaries rhombic, rudimentary, not united to the front of the maxilla, generally lost in maceration. The front upper grinders small, cylindrical, truncated, not nearly so large as the others. The second upper grinder largest, generally gradually smaller backwards. The front lower grinder broad, compressed, broader than the rest. The others cylindrical, the hinder the largest. The front upper grinder in the very young specimen is small and conical when the other grinders in the upper and lower jaws are well developed, being very different in this respect from the two-toed Sloths or *Cholœpi*. The malar bone moderately short, with a large inferior process and an elongated ascending superior process, which is often more or less dilated at the end, especially in the genus *Bradypus*.

BRADYPUS.

Bradypus, Gray, P. Z. S. 1849, p. 67.

Pterygoid swollen, hollow, vesicular. Males and females similar. Lower jaw with a short truncated anterior lobe varying in width at the anterior end. Intermaxillary bone rhombic, as broad as long. The angle of the lower jaw is broad, triangular, with a rounded lower edge, and produced far behind the condyle (see skulls, P. Z. S. 1849, p. 65, t. x.). The lower ramus of the malar bone is simple, elongate, triangular, and the upper ramus much produced and dilated at the end.

De Blainville figures a skull of a young animal under the name of *B. torquatus*, t. iii.; but the figure looks much more like the skull of an *Arctopithecus*; for it does not represent the peculiar dilated appearance of the upper malar bone.

The three nearly adult skulls of *Bradypus* in the British Museum vary in the flatness or convexity of the front of the forehead, two of them being rather narrow and concave between the orbits, and one (see *Bradypus crinitus*, P. Z. S. 1849, t. x. f. 1) convex and wider. I have figured the latter under the name of *B. affinis* in the 'Proceedings' of this Society, 1849, t. x. f. 2, skull (737*a*).

This skull (737*a*) which I have so distinguished differs in several other points from the other two; that is to say, it has a rather narrower hinder opening to the nostrils, and the vesicular pterygoids, instead of being broad and ovate, are narrow, as in 923*a* and *b*, elongate, and compressed; and I am inclined to think these indications of a distinct species, but they may be marks of the sex. The nose is rather narrower.

1. BRADYPUS CRINITUS.

Skull rather concave between the eyes.

Bradypus torquatus, Prince Maximilian, Abbildungen, t. (good figure of female).

Bradypus crinitus, Gray, P. Z. S. 1847, p. 67, t. x. f. 1 (skull); and Cat. Edentata B. M. p. 364.

Hab. Brazil, Para, Rio Janeiro.

We have three specimens of this species in the British Museum—one from Brazil presented by Lord Stuart de Rothsay, the others without any precise locality, but said to be from South America. They are very much alike, but vary in the length of the black nuchal crest and in the intensity of its colour; in the largest specimen it is the shortest and of a brownish black colour; none of the specimens has the brown tint of the figure of *Bradypus torquatus*, Illiger, represented in Wagner's 'Supplement to Schreber's Säugthiere,' tab. lxiv. A.

2. BRADYPUS AFFINIS.

Skull rather convex between the orbits.

Bradypus affinis, Gray, P. Z. S. 1849, p. 68, t. x. f. 2 (skull); Cat. Edentata B. M. p. 364.

ARCTOPITHECUS.

Pterygoids compressed, crest-like, solid. Males with a patch of soft hair between the shoulders not found in the females. Intermaxillary bone rhombic, with an attenuated process behind. The front of the lower jaw broad and truncated, sometimes with a slight keel in the centre near the upper margin. The front grinders are short and blunt. The upper process of the malar bone attenuated.

Arctopithecus, Gray, P. Z. S. 1849, p. 69; Cat. Edentata B. M. p. 364.

The hinder angle of the lower jaw differs very considerably in shape, as I showed in the 'Proc. Zool. Soc.' 1849, t. xi. f. 1, 3, 4, 5, 6. The sutures between the bones of the face are often distinguishable in well-developed skulls, which evidently belong to full-grown animals.

In the two preceding genera no difference has been observed between the colour of the males and the females; but from numerous observations that have been made upon specimens of this genus I think that it may now be established that the males are ornamented differently from the females—that is to say, that they have a patch of soft short hair between the shoulders, which is generally of a more or less orange-colour, and in one species pure white. The females, on the contrary, are destitute of this mark. Both sexes generally have a more or less distinct black dorsal streak and abundant soft under-fur which agrees in colour with the long hair above it.

As this difference of the colouring of the sexes has produced various opinions, and sometimes caused the sexes of the same animal to be regarded as distinct species, I have given a *résumé* of the various ideas on the subject, and of the characters that have been given of the species by the authors who have studied the whole genus.

Buffon (Histoire Nat. xiii. 1765, p. 60), in his account of the Aï, figures what he calls the "jeunes Aïs" (tab. v.), which are probably young females, and "l'Aï adulte" (tab. vi.), which is evidently a male. Daubenton in his description calls this the first specimen, and observes that he gives to it the name of "Aï de dos brûlé, parce qu'il semble que son poil ait été en effet brûlé sur la dos." This is evidently the male of *A. blainvillei*; for he says the head and *neck* are covered with long flexible brown-black hair; and the young (the second), he says, chiefly differs from the former by the face being surrounded by yellowish and the head and neck blackish; therefore it is difficult to say whether it is the female of *Bradypus* *blainvillei* or *cuculliger*; but it is most probably the former, as he says that the throat is brown.

Cuvier, in the 'Animal Kingdom,' edit. 1, vol. i. p. 217, says, "Sa couleur est grise, souvent tachetée sur le dos de brun et de blanc; plusieurs individus portent entre les épaules une tache d'un fauve vif que traverse une ligne longitudinale noire. On ignore s'ils forment espèce." He adds, "On connaît un *Aï* dit *le dos brûlé*, parce qu'il a entre les épaules une tache noire entourée de fauve; ce n'est selon M. Temminck, qu'une variété résultant de ce que des longs poils de ses épaules sont usés." (Cuvier, Règ. Animal, ed. 2. p. 225.)

Dr. John Wagler, in the 'Isis' for 1831, p. 604, wrote an essay on the genus *Bradypus*, of which he notices four species:—1. *B. cuculliger*, from Surinam, Cayenne, and Guiana; 2. *B. ai*, from Brazil; 3. *B. torquatus*, Brazil; 4. *B. infuscatus*. He considers the female of *B. cuculliger* and *B. infuscatus* distinguished by an orange or yellow spot on the middle of the back between the shoulders; for he says particularly in the description of *B. cuculliger*, "Macula spinæ dorsi (in fœmina) pone humerum subrotunda, læte aurantiaca, medio longitudinaliter vitta aterrima dissecta" (p. 605), and that, in *B. ai*, "Macula spinæ dorsi (in fœmina) pone humerum subrotunda, pilis adjacentibus plus minusve tecta, fuscescenti-flavida, vitta per medium nigrescente longitudinaliter signata; pili hujus maculæ mollissimi sunt, quasi sericei;" and he describes a new species under the name of *B. infuscatus* with the following character:—"Intense fuliginoso-fuscus, seriebus macularum in dorso fuscescenti-albarum longitudinalibus quatuor; fronte temporibusque flavido-albis; vitta utrinque pone oculum oblique ad mentum deducta distinctissima fusco-atra inferius flavido-albo limbata; collo toto anteriore ac gastræo notæi colore, immaculatis. *Adult.*

"Pili appressiores quam in speciebus præcedentibus, multo breviores, ungues ac extremitates longiores, multo graciliores; hi fuscescenti-flavi; pedes supra albido maculati.

"Longitudo 1′ 11″, caudæ 1″ 11‴, antibrachii, exclusis unguibus 15″, scelidum 8″ 2‴.

"Habitat in *Brasilia* versus *Peru.*"

Dr. John Andreas Wagner, in the Supplement to Schreber's 'Säugthiere,' iv. 1844, p. 132, describes four species of *Bradypus* (including *B. torquatus*); but he evidently regards the orange mark on the back as the character of the male, and not of the female as Wagler had considered them.

1. *B. pallidus*, Wagner, he says, is *B. tridactylus* of Cuvier, and *B. ai* of Wagler; and at p. 143 he gives to it the following characters:—

"*B.* e rufescente pallide cano-lutescens; notæo longitudinaliter albo-maculato; fronte alba; vitta utrinque post oculum oblique ducta fusca; collo gastræoque notæi colore, immaculatis; macula *dorsali aurantio-fulva nulla.*" This cannot be the *Bradypus ai* of Wagler, which he thus describes:—"Cinereo-fuscescens sive rufescens, notæo tæniis duabus longitudinalibus albido-maculosis notato; fronte alba; vitta utrinque pone oculum oblique retrorsum ducta obscure fusca, inferius albido limbata; collo anteriore toto ac gastræo notæi colore, immaculatis. *Adult.*

"*Animal junius.* Rufescens; notæo distinctius albo-bivittato; fronte stricte aut vix alba; vitta oculorum breviore, ad initium supra et subtus rufescenti-albo limbata.

"Macula spinæ dorsi (*in fœmina*) pone humerum subrotunda; pilis adjacentibus plus minusve tecta fuscescenti-flavida, vitta per medium nigrescente longitudinaliter signata; pili hujus maculæ mollissimi sunt, quasi sericei; pedes supra albido maculati; ungues albo-flavidi." (Isis, p. 610.)

I have seen no specimen that agrees with Wagner's description.

2. *B. cuculliger,* Wagl. Isis, 1831, p. 605.

B. cano-brunescens, irregulariter albo maculatus; sincipite facie guttureque pilis abbreviatis flavido-albis vestitis; occipite cerviceque pilis longioribus umbrino-fuscis supra juguli latera decumbentibus, stria postoculari nulla; vitta dorsali fusca, maculam ♂ aurantiacam persecante."

This, he says, is *gularis* of Rüppell, the *Aï* (adulte) of Buffon (tab. v. & vi.), and the "*Aï à dos brûlé*" of Daubenton. I think that this latter reference is a mistake, as Daubenton describes the throat as brown.

Wagler describes properly the streak before and behind the eye as very short, which agrees with our specimens; but Wagner says there are none, which would seem to indicate that his species must be different.

3. *B. infuscatus,* Wagl. Isis, 1831, p. 611.

"*B.* fuliginoso-fuscus, supra seriebus longitudinalibus macularum albidarum subquaternis; fronte temporibusque flavido-albis; vitta utrinque post oculum oblique deducta nigra; vitta dorsali fusca, maculam ♂ aurantiacam persecante.

"Var. α. Intense fuliginoso-fusca, maculis dorsalibus dilute brunnescentibus; mandibula gulaque fuscescentibus.

"Var. β. Maculis dorsalibus sordide albidis, mandibula gulaque pilis bicoloribus apice longius flavescentibus, basi fuscis.

"Var. γ. Paululum pallidior, mandibula gulaque brunnescentibus aut sordide lutescentibus." (Wagner, Supp. to Schreber's Säugt. iv. p. 148, 1844.)

The character here given is a mere transcript of the one given by Wagler as quoted in a former page; but he adds that the male has an orange dorsal spot, which is not mentioned by Wagler.

Mr. Bridges considered the specimen he brought from Bolivia, with a yellow patch on the back, to be the male of the specimen without it; but we had no verification of the fact.

In 1845, Rüppell, in the 'Mus. Senckenbergianum,' iii. p. 138, described a Sloth with an orange patch on the back as a species under the name *Bradypus gularis,* and at tab. xi. gives two figures of it, one of them being coloured.

In my monograph, published in the 'Proceedings of the Zoological Society' for 1849, p. 69, under these conflicting opinions I considered the orange mark a specific character, and adopted Rüppell's

Bradypus gularis for what are now considered the males of more than one species.

Mr. Salvin, in June 1869, informed me that the series of four specimens of *A. griseus*, which he obtained for the British Museum, were all shot together, and formed one family, consisting of a male, a female, and two young of different ages; that the male had a yellow patch with a black central streak on the back, which was not present in the female and young. This observation induced me to examine the other specimens in the Museum which have the yellow patch on their backs; and I am satisfied that they belong to two species, which agree in all the characters, except the patch, with the two species that I had named *Arctopithecus marmoratus* and *Arctopithecus blainvillei*; and therefore I have come to the conclusion that they are the males of those species. One cannot be certain, because the sex of the specimens cannot be determined in the skins as they are in the Museum, and the travelling naturalists who collected them have not taken the trouble to mark the sex to which they belonged. I think this idea is confirmed, that all the young specimens which I have seen are like what are here regarded as females, and perhaps the patch does not appear until the animal reaches nearly adult age. The under-fur is generally abundant, very soft. It is white or black, like the base of the longer hair. It seems to be more abundant in the species with long flaccid hair, which generally have grey tips to the hair, and shortest and least abundant in *A. cuculliger*, which has shorter and more rigid hair, and is rather sooty-coloured.

Cuvier, in the 'Ossemens Fossiles,' v. t. 6, 7, figured the skeleton and skull of this genus, *A. problematicus*?

Blainville, in his 'Ostéographie,' figures the skulls of two animals; one he calls *B. tridactylus brasiliensis*, and the other *B. tridactylus guianensis*, differing in the hinder part of the lower jaw.

In my paper in the 'Proceedings' 1849, I pointed out that the hinder part of the lower jaw seemed to afford very good characters for the separation of the species, and figured this part from several specimens.

The species may be arranged according to the skull thus (and I have found them subject to little or no variation in general form, and change little in growth):—

1. Skull: nose rather elongate, narrow; lower jaw elongate, shallow, the hinder angle much produced.—*A. cuculliger*, *A. marmoratus.*
2. Skull: nose rather elongate, narrow; angle of lower jaw rather produced, broad.—*A. problematicus.*
3. Skull: nose very short, broad; angle of lower jaw produced, broad.—*A. boliviensis*, *A. flaccidus*, *A. griseus*, *A. castaneiceps.*
4. Skull: nose very short, broad; angle of the lower jaw scarcely produced, very broad.—*A. blainvillei.*

In this and my other paper of the kind I have only paid attention to the zoological characters of the skulls, and not preferred to examine and describe them osteologically; not that I in the least underestimate the value of this very interesting and important branch of science; but the theory of the structure of the skeleton has very little to do with the zoological distribution, and, to judge by the results, a scientific man who has paid great attention to that study may have a very imperfect idea of the value of the zoological character afforded by the skull as a whole, and most crude ideas of the connexion of the genera with one another, even in examining the perfect skeletons of living animals; indeed such ideas make one lose all confidence when the same kind of study is applied to fossil remains. I need only refer to the extraordinary mistakes that have been made in naming the skulls of such large animals as Crocodiles, Rhinoceroses, Tapirs, and Cetacea by one of the most celebrated osteologists, in which he has given the same species various names and included under the same name several most distinct species; and if this be the case where perfect specimens are to be examined, what must we expect of multitudes of genera established on small fragments found in a fossil state, or of the affinities they are said to present. Paleontology, as it is called, will never be worthy the name of science until the paleontologist has a good knowledge of recent species and their characters, and the bones of the recent and fossil species are studied together.

I. *Fur moderately long and rather rigid, dark grey; back with a dorsal streak and distinct white spots. Males with a large yellow patch of soft hair on the back.*

a. *Forehead, cheeks, chin, and throat with short, erect, rigid, yellow hair.*

1. ARCTOPITHECUS CUCULLIGER. The Yellow-throated Ai. B.M.

Forehead, temple, chin, and throat covered with short, erect, yellow hair, surrounded by a more or less broad black collar; spot behind the eye small; fur blackish, short, rigid; under-fur short, sparse. Skull: nose rather elongate, narrow; lower jaw moderately strong; the front lower grinder flat, smooth, and moderately broad in front; angle of the lower jaw much produced, slender, elongate.

♂ and ♀. *Bradypus cuculliger*, Wagler, Isis, 1831, p. 605; and Wagner, iv. p. 145? Rapp, Edentata, v. t. 3. f. 1 (skull).

Bradypus tridactylus guianensis, Blainville, Ostéog. t. ii. fig.

Arctopithecus gularis (part.), Gray, Cat. Edentata, p. 364; P. Z. S. 1849, t. xi. f. 6 (angle of lower jaw).

♀. Blackish; shoulders, back, and haunches covered over with close large black spots. The head and throat yellow.

Young. Fur long, soft, and flaccid, grey-brown; back whitish, mottled; face and throat yellowish; eye-streak and circumference of head and neck blackish.

Hab. Guiana (*Rüppell*); Demerara, Brit. Mus.

Wagner says this species has no postocular streak; but this does not agree with our specimen. The fur of the female in the Museum is not so harsh as that of the males, and is blackish grey closely white-spotted; but the colour of the face and throat are the same.

A young specimen in the Museum, obtained from Mr. Warwick, has the fur very soft and greyer than in the adult, and therefore the white spots are less distinct; the black postocular spot is small but distinct. It is curious that Dr. J. A. Wagner, in his specific characters of *B. cuculliger*, particularly marks "*stria postoculari nulla.*" In our specimens it is distinct, but smaller than in *B. infuscatus.*

Variety. Male: the dorsal patch dark orange-yellow with a broad tapering black central streak and a black spot, but with the outer margin of the same colour as the rest of the back, and not intense black as in the other specimen.

Hab. ——? B.M.

2. ARCTOPITHECUS GULARIS.

Fur much longer and more flaccid, brownish grey, with large blotches of white on the back.

♂. *Bradypus gularis*, Rüppell, Mus. Senck. 1. 2. 3, p. 138, t.

Hab. Surinam (*C. Bartlett*).

We have only a skin, without the skull, of a half-grown animal; the length of the fur does not appear to depend upon age, as it is longer than in the female of the more rigid-haired species in the Museum. It may prove to be a distinct species when the skull is observed.

Wagner describes *B. cuculliger* as having coarse, brittle, long whitish-brown hair; and he quotes *B. gularis*, Rüppell, as a synonym of it. Rüppell describes his species as "corpore pilis longis laxis;" and further, the hair of three kinds:—first, long, cylindrical, and soft to the feel, mostly of a blackish colour; second, more elongate and perceptibly compressed at the ends, and whitish; third, fine short woolly hair among the other, grey or white. Our specimen which agrees with this is without the skull; and Rüppell does not describe or figure the skull of his specimen; so we do not know if it is like, or different from, *A. cuculliger.*

b. *Nose and forehead covered with short soft yellow hair, which is erect at the hinder part of the forehead; cheeks, chin, and throat covered with thin harsher hair, like the rest of the body.*

L'Aï adulte, Buffon, Hist. Nat. vol. xiii. tab. vi.

L'Aï second à dos brûlé, Daubenton in Buffon's Hist. Nat. vol. xiii. p. 62.

Acheus ustus, Lesson, Espèces des Mammifères, p. 271, from Buffon's figure, is a male of a species of this section.

The *Bradypus ai* and *B. infuscatus* of Wagler, Isis, 1831, pp. 611, 612, and *B. pallidus* of Wagner, appear to belong to this division; but I cannot fit them on to any of the specimens in the Museum.

3. ARCTOPITHECUS BLAINVILLEI. B.M.

Forehead and temples with short, erect, yellow hair; chin, cheeks, and throat with hair like the back, but rather darker. Skull: the upper postorbital tubercle scarcely produced; the lower jaw short, strong, the front part high and much thickened; angle of the lower jaw broad, rounded, and scarcely produced. (P. Z. S. 1849, t. xi. f. 2, no. 919*a*).

Bradypus tridactylus brasiliensis, Blainville, Ostéogr. *Bradypus*, t. ii. (skull).

Arctopithecus blainvillei, Gray, P. Z. S. 1849, p. 71, t. xi. f. 2 (skull); Cat. Edentata, p. 365.

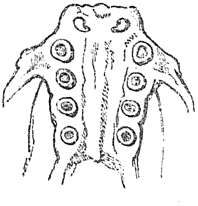
Hab. Brazil.

There are four skulls of this species in the British Museum, which are all very much alike, but differ in the convexity of the forehead. There are two specimens with their skulls, and one younger, which appear to belong to the same set. The front lower grinder is moderately broad and flat and smooth in front in all the four specimens, not quite so broad as the corresponding tooth in *A. boliviensis*; and the lower jaws are rather stronger and blunter in front than in that species.

4. ARCTOPITHECUS BOLIVIENSIS. B.M.

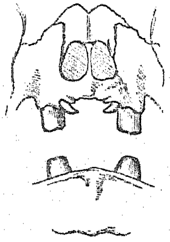
Blackish grey; frontal band extending on to the temples, streak under the eye-streak and cheeks white; forearms, shoulders, and front of the back mottled with whitish colour; hinder part of the back, rump, and thighs white, with one or two small brown spots; chin and throat blackish grey, like the back. ♂. Patch on the back

Fig. 3.



Palate of *Arctopithecus boliviensis*.

Fig. 4.



Front view of skull of *Arctopithecus boliviensis*.

orange with a black stripe. The lower jaw short, thick, and strong; the angle of the lower jaw slightly produced beyond the condyle, rounded at the end (921 *a*).

Arctopithecus gularis (part.), Gray, P. Z. S. 1849, t. xi. f. 6 (lower jaw).

♀. Back with a distinct black stripe, with white spots up to the shoulders (920 *b*).

Arctopithecus marmoratus (jun.), Gray, P. Z. S. 1849, p. 71, t. xi. f. 4 (lower jaw).

Hab. Bolivia (*Bridges*).

This species is quite distinct from *A. cuculliger*. *A. gularis* was formerly thought to include all the species with an orange spot on the back.

The front lower grinder is large and broad, flat and smooth in front, both in the male and female specimens; and the upper front grinder is equally rounded.

There is a series of two males, a female, and young of this species in the Free Museum at Liverpool, from Bolivia, with their skulls. They are all very similar in the form of the lower jaw. The young has very flaccid hair and is probably a male, as it has a small spot of soft black hair between the shoulders, probably the commencement of the dorsal patch.

5. ARCTOPITHECUS MARMORATUS.

Fur grey-brown; back, shoulders, and rump white, black-spotted; forehead and sides of face with very short soft white hair, which only thinly covers the nose; eye-streak brown; dorsal streak distinct. Skull: nose narrow, rather elongate; upper front grinder narrow, cylindrical. Lower jaw slender, elongate, thickened in front; hinder angle much produced beyond the condyle, tapering, rounded at the end (P. Z. S. 1849, t. xi. f. 3). Front lower grinder rather broad, three-ribbed in front.

Male unknown.

Arctopithecus marmoratus, Gray, P. Z. S. 1849, p. 71, t. xi. f. 3 (lower jaw); Cat. Edentata B. M. p. 305.

Hab. Brazil.

The lower jaw of this species is much more slender and weaker than either of the preceding, and in this respect and in the form of the hinder angle it is like the lower jaw of *A. cuculliger*, but is distinguished from both sexes of that animal by having the chin and throat covered with grey-brown decumbent hair, like the back. It was this similarity that induced me to refer De Blainville's figure of the skull of *A. cuculliger* to this species in my former paper.

There is a second specimen in the Museum of which I have not seen the skull, which is somewhat like the type; but the arms and shoulders are blackish grey, not varied. This specimen is very peculiar for the fur between the shoulder being softer than usual; but there is no indication of any yellow spot. It may be a distinct species from any here described.

These three species with a spotted back and frontal band of soft white hair are very much alike externally, though they have differences which are not easily expressed in words; but perhaps they would be more easily defined if we had a larger series of both sexes with an accurate account of the locality which each form inhabits. They are easily distinguished by the form of the lower jaw, a character that I pointed out in my former paper published in the 'Proceedings' of 1849. That this character is permanent and not unimportant in the economy of the animal is proved by the examination of several specimens. Thus we have four skulls of *A. blainvillei*, and two of *A. marmoratus*.

The outline of the hinder part of the lower jaw of *A. boliviensis* is intermediate between those of *A. blainvillei* and *A. marmoratus*; but this must almost always occur when three jaws are compared together in a proper series for the purpose. This does not, however, form any ground for believing them to be variations of the same form or species. The difference of form appears to be constant when several skulls of the same species are observed. It is so, certainly, in five skulls of *A. blainvillei* in the British Museum. I have never seen any lower jaws that seem to me to pass by intermediate gradations from one of these forms to another. The long-produced hinder angle appears to be always in connexion with the elongate slender jaw, and the shortly produced one with the short, high, strong part of the jaw.

In fact the species of this genus are very imperfectly understood, and, I believe, will prove to be more numerous than has hitherto been believed.

This paper is the result of examination and re-examination of the large series of specimens and skulls and other bones of these animals in the British Museum, which has occupied me three or four hours a day for upwards of three weeks, not consecutively, but leaving time between the different examinations that the mind might come fresh to the subject—in the same manner as I have worked out other monographs which have lately appeared.

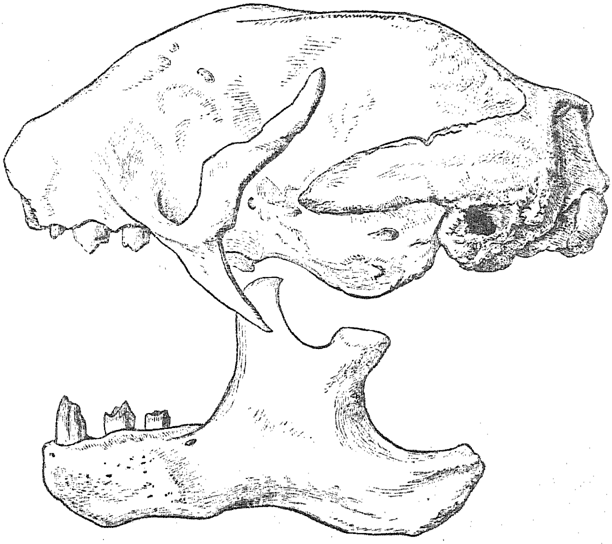
There is not much inducement to bestow this labour on the groups; for no sooner does the result appear, than some tyro in zoological studies, probably more a sportsman than a zoologist, who has shot and measured a few animals, comes to the Museum, casually inspecting the specimens, sometimes overlooking the most important of them, and gives his opinion, *ex cathedrâ*, on what he considers the distinctions of the species or their synonyma; and unfortunately the compilers who come after the working zoologist, regard all the writers as of equal authority, and thus throw back the progress of science.

c. *Nose, forehead, cheeks, and chin covered with reflexed hair, like the back, which is shorter and bent forward over the nose.*

6. ARCTOPITHECUS CASTANEICEPS. (Plate XXXV.)

Fur rather elongate and flaccid, blackish grey; hinder part of the back and loins whitish, browner on the rump and hind legs; head, throat, and sides of neck covered with elongated chestnut-brown hair, forming a kind of hood on the sides; forehead paler, yellowish; eye-streak dark brown; dorsal patch large, orange-colour. Angle of the lower jaw large, broad, rounded at the end, and much produced beyond the condyle. Female unknown.

Fig. 5.



Skull of *Arctopithecus castaneiceps*.

Dr. Seemann brought this specimen from Nicaragua. He says it was bright green when alive, as mentioned in his letter. The specimen does not now exhibit any of the green tint in the parts exposed to the light; but the sides of the body, covered by the arms being pressed against them, retain still some remains of it.

Hab. Nicaragua (*Dr. Seemann*).

This cannot be *Bradypus infuscatus* of Wagler; it does not agree with the description. It is a male (?), with long fur of a grey-brown colour intermixed with white hairs. The face, forehead, cheeks and chin are of a reddish brown, the under part of the body is pale brownish white, the sides of the neck have a long ruff of recurved dark brown hair, darker than that of the face. The shoulders and hinder part of back are varied with large patches of whitish hair. The middle of the back between the shoulders has a very large patch of soft yellow hair, having a well-marked, narrow, black central streak, which commences with a triangular black spot on the upper edge of the yellow patch, and is continued into the white part of the fur on the loins.

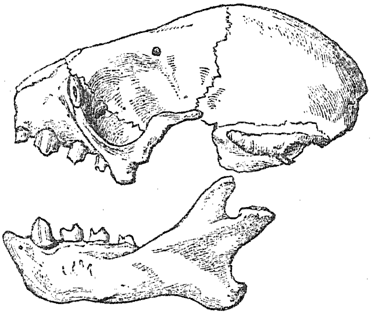
II. *Fur grey, elongate, flaccid, sometimes very indistinctly marbled with white blotches.*

a. *The male with a large yellow soft patch of hair on the back.*

7. ARCTOPITHECUS GRISEUS. (Plate XXXVI.)

Fur very long, greyish white, scarcely mottled; under-fur very long and abundant, black or white. Forehead and cheeks yellowish white; a broad band across the crown of the head and a broad streak from the orbits black. Male with a large yellow patch of soft hair in the middle of the back, with a broad central streak, and varied with blackish brown on the margins. Angle of the lower jaw broad, rounded, not produced beyond the back edge of the condyle.

Fig. 6.



Skull of *Arctopithecus griseus.*

Arctopithecus griseus, Gray, Ann. & Mag. N. H. 1871, vii. p. 302.

Hab. Costa Rica, Cordillera del Chucu, Veragua (*Salvin*).

The males and females have a more or less distinct dark dorsal spot, which is only visible when the animal is very carefully examined; and the general fur shows in some lights indefinite pale blotches on the back and limbs, which are produced by certain dark parts of the under-fur. The upper parts and sides of the head and neck dark brown; the forehead, the cheeks, and chin white; this white colour occupies a less space of the chin and cheeks, and is less marked in the males than in the females or young. The black streak through the eye is distinct, is widened out on the sides of the face in the males, but is narrower behind and shorter in the female and young. The under-fur is very abundant and very soft, elongate, pure white, and with black or chocolate-brown in spots, producing rather a mottled appearance. Two of these white spots on the middle of the back are very distinctly marked in the female, and I at first thought they were a good character for a separate species; but I find, now the specimens are stuffed, that there are similar spots scattered over the bodies of all four specimens. The dorsal spot of the male is pale yellow with a very black central band, paler yellow or nearly white on the edge, and marked with irregular unsymmetrical brown spots.

Bradypus ephippiger, Philippi, Archiv f. Naturg. 1870, p. 265, t. iii. 1, 2 (male and skull), is thus described:—

"The Museum of Santiago has just received a male *Bradypus*, of the division *Arctopithecus*, which likewise has a yellow nape-patch, but in general colour agrees neither with *B. gularis* nor *B. cucullatus* nor *B. infuscatus*. Its face is clothed with rather fine, short, close hairs, which are grey around the mouth and nasal openings, yellowish white on the cheeks and forehead, whilst a brownish black streak begins in front of the eye, goes over the ear, and gradually mingles itself with the brownish black colour of the neck. The hairs always become longer and more rigid the nearer they are to the neck. The hairs on the crown are brownish black, much stiffer and longer than those on the face, but not so long as those of the body, and so directed forward that they stand over the white forehead like a roll. The hairs under the chin are light brown, and become on the throat gradually longer and darker.

"The hairs of the body are more than two inches long, flat, some white, some grey-brown, so that on the sides and the extremities there is a somewhat piebald appearance, whilst those of the crown and occiput are dark brown, which colour gradually becomes lighter behind, palest and almost white on the underside of the belly. Between the shoulders and almost to the middle of the back there is a clear yellow patch, which is composed of thickly set hairs; in the middle it displays a black streak, and on each side at the edges, close to the long-haired fur, three round black spots. The moderately short hairs of these spots are very different from the long, coarse, flat, bristly hairs, also from the far longer, far finer and softer, perpendicular wool-hairs, which are everywhere beneath the bristly hairs, and are white on the light parts of the body, and ash-grey on the darker parts. Each foot has three white equal-length claws."

Hab. Uncertain. Brought to Santiago from either Guayaquil or Callao, probably obtained in Ecuador or North Peru.

The description and the figure, which is not very good, agree pretty well with the male *Arctopithecus griseus* obtained by Mr. Salvin from Costa Rica, and it is evidently nearly allied to that species; but, if the figure of the hinder part of the lower jaw be correct and of a perfect specimen, it is very different from any skull of *Arctopithecus* I have seen. The lower hinder angle is much produced behind, broad, triangular, nearly equilateral, with a bifid end. The skull of two of the older specimens of *A. griseus* are unfortunately imperfect in the hinder part; but that of a young specimen has the hinder angle broad, rounded, and scarcely produced. All the specimens of *A. griseus* in the British Museum have a much larger and broader eye-streak than represented in the figure; and the male has nearly the whole cheeks of a black colour, and not whitish, as described and figured.

b. *The male with a small patch of soft white hair on the back.*

8. ARCTOPITHECUS FLACCIDUS. (Plate XXXVII.)

Fur elongate, flaccid, grey, very indistinctly marbled with white; under-fur very abundant, white and black in spots and blotches. Skull with a short broad nose. Lower jaw thick, short, high, thickened in front and very blunt; angle of lower jaw produced beyond the back edge of the condyle, rather broad (P. Z. S. 1849, t. xi. f. 1 *a*).

Bradypus tridactylus?, Prince Maximilian, Abbildungen. Female and young.
Bradypus ai, Wagler, Isis, 1831, p. 610?
Bradypus pallidus, Wagner, Suppl. iv. p. 143?
Arctopithecus flaccidus, Gray, P. Z. S. 1849, p. 72, t. xi. f. 1 (skull); Cat. Edentata, p. 365.
Hab. Venezuela (*Dyson*); Pará (*J. P. G. Smith*).

The figure of the skull, t. xi. f. 1, in the P. Z. S. 1849, represents the angle of the lower jaw as slender and acute; but the underside of the angle represented has been broken off, and the smaller figure, t. xi. f. 1 *a*, represents the true form of this part. There is a skeleton in the Museum which I believe belongs to this species.

The two specimens in the Museum are probably males; but we have no means of determining the fact. They are both peculiar for the long, soft, flaccid hair, of a dull whitish-grey colour, without any indication of white or black markings, being only slightly grizzled by some of the hairs being whiter than the rest. There is a very abundant, rather long, very soft, blackish brown under-fur, and only a slight indication of a broad, short, blackish dorsal streak seen at the base of a deep concavity in the fur between the shoulders. This streak is much more visible in the specimen from Venezuela than in the smaller one brought by my son-in-law from Pará.

Prince Maximilian of Neuwied, in his 'Abbildungen,' has given a beautiful figure of a female *Bradypus tridactylus*, and its young one on its back, which is probably intended for *A. flaccidus*; for it has the long flaccid hair of this division; and he says the female has the longitudinal black streak in the woolly hair, and that the male has a longitudinal white line on each side of the back. Does he mean by this the small white central spot of soft hair between the shoulders, which is characteristic of this species?

Wagner refers this figure to his *Bradypus pallidus*; and the specific character may be only a travesty of Prince Maximilian's description, where he changes the white longitudinal streak into the back being longitudinally white-spotted, observing there is no orange fulvous dorsal spot, not thinking that the white stripes replace this patch in the other species—that is to say, if the figure represents *A. flaccidus*, which I think is probable; and it is the best published figure of the genus.

L'Aï, Cuvier, Oss. Foss. vol. v. t. vi. & vii. (skeleton and skull).
A. problematicus, Gray, P. Z. S. 1849, p. 73, t. xi. f. 5.
Bradypus problematicus, Gerrard, Cat. Bones Mam. p. 290.

I have now little doubt that the figure of the skeleton by Cuvier and the skull which my son-in-law brought from Pará, on which I founded *A. problematicus*, belong to *A. flaccidus*. We have also a skeleton which appears to belong to the same species in the British Museum.

5. Catalogue of the Land-shells inhabiting Polynesia, with Remarks on their Synonymy, Distribution, and Variation, and Descriptions of New Genera and Species. By W. Harper Pease, C.M.Z.S.

[Received April 4, 1871.]

The geographical limits of Polynesia may be determined from the distribution of its land-shells, as distinctly as by that of its marine mollusca and zoophytes. They characterize it as being a distinct zoological province, separate from the East-Indian.

It is not only the largest in extent, but the most isolated in position of any on the surface of the earth. Stretching over nearly one fourth of the whole circumference of the globe, and from one extreme of the tropics to the other, it is separated by a wide expanse of ocean on three of its sides, north, east, and south, from the nearest provinces. On the extreme west, at the Pelew Islands, it comes into contact with the Philippines, and a short distance south, at the Samoas, with the Papuan Islands.

I do not propose to enter into a critical examination of the distribution and variation of the several genera and species, their relation to those inhabiting the neighbouring provinces and their probable origin, as it would involve the discussion of several collateral questions, such as the origin of the islands, their topography, formation of valleys, &c., which I am not at present prepared to enter on.

As to general distribution I note the following facts. In West Polynesia, comprising the Pelews, Ladrones, Caroline, Ralick, and Radack groups, a few East-Indian types have entered, but do not prevail, the Polynesian predominating. Of *Helices* two species of the large Philippine forms occur, viz. *H. pelewana*, Pfr., at the Pelews, and *H. sowerbyana*, Pfr., at Hogoleu. All the others are of Polynesian types.

The genus *Pitys*, so prolific in species throughout all other parts of Polynesia, is not represented by a single species. *Partulæ* occur on all the islands.

Of operculated genera the East-Indian Diplommatinacea are represented by the genus *Palaina* at the Pelews, and one species at Ponape; they extend no further. All the species of *Omphalotropis* are of the East-Indian type, carinate at the umbilicus, and more or less varied with colours. One species referred to *Cyclophorus* and one to *Cyclostomus*, both of doubtful genera, have been found at

Hogoleu. The genus *Registoma* is represented by a single species. All the above East-Indian forms occur on the most westerly islands, which have not been thoroughly explored; I anticipate that, when searched, they will yield a much larger proportion of Polynesian species, for the reason that these are of small size, and have escaped the notice of inexperienced collectors.

Passing south over the Tarawan Islands (Kingsmill), all of which are low atolls, we arrive at the Samoas, the nearest group in Southern Polynesia to the Papuan Islands; it has yielded but a small number of species, although it has been explored by several persons within the past ten years*; they are all peculiar or of Polynesian types. Going on east to the Tahitian, Hervey, Austral, Paumotus, and Marquesan groups, comprising over one half of all the Polynesian islands, we find them inhabited by pure Polynesian forms.

The genus *Partula* here attains to its highest development; also *Pitys* and other genera of *Helicinæ*. All the operculated genera, with the exception of the cosmopolitan genera *Helicina* and *Truncatella*, are peculiar. The type of *Omphalotropis*, Pfr., does not extend to this part of Polynesia; but the genus is represented by several peculiar varieties which I have distinguished under the subgeneric names of *Scalinella*, *Atropis*, and *Cyclomorpha*.

The genus *Diadema*, Pse., is confined to the Hervey group; and *Chondrella*, Pse., is widely spread over the several islands. Two of the genera characteristic of the Polynesian fauna appear to have passed over to the Papuan Islands, viz. *Partula* and *Pitys*; of the former, nineteen species have been described from those islands. With one or two exceptions they are of simple bulimiform shape, and may not, at least all, prove to belong to the genus. Thirty-five or more species of *Helices* have been described from the Papuan Islands, Australia, New Zealand, and Tasmania, under the genera *Patula*, *Discus*, &c., which are nearly related to the Polynesian genus *Pitys*. They are generally more planorboid in shape, with the aperture open and not laminate or dentate; their relation to the genus *Pitys* cannot be determined until the animals are examined and compared.

It appears, therefore, that while a few East-Indian types have entered and extend a short distance into Western Polynesia, as might be expected from their near contact on the south, the Polynesian genera have passed over to the Papuan Islands.

The Hawaiian Islands, on the northerly boundary of Polynesia, present several peculiarities in both their marine and land fauna, as might be supposed from their isolated position. Over two thirds of all the land-shells belong to the *Helicterinæ*, all of which are confined to that group of islands, as also the genera *Carelia* and *Catinella*. The several genera of *Helicinæ* are common with Southern Polynesia.

The only operculated genus is *Helicina*; while on the islands of Southern and Western Polynesia no less than sixteen occur. It is also the only locality in which the genera *Blauneria*, *Pedipes*, and *Ophicardelus* of the Melampinæ have been discovered.

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* The Samoan Islands, in proportion to their size, are inhabited by a few more than one quarter of the number of species found at the Tahitian.

As to general variation I note one fact. The species of most of the genera inhabiting Southern and Western Polynesia, ranging over a distance of more than 5000 miles from the Pelews to the Marquesas, vary less from a common type than those on the Hawaiian Islands, which are restricted in their distribution to 300 miles. *Partula*, the prevailing genus of Southern and Western Polynesia, occurring on all the high islands, presents so little variation that not a single subgenus has been proposed; while at the Hawaiian Islands the genus *Helicter* varies more on any one of the islands, even the smallest, but eight miles in length, than the *Partulæ* throughout their whole range. I select the two genera above in illustration, as the species are the largest in size, and comprise together nearly one half of all the land-shells inhabiting Polynesia.

I now offer a few remarks on the genera, adding to each descriptions of such species as I find in my collection to be new.

Genus PITYS.

Pitys, Beck, Index Molluscorum, 1837, p. 9.

The above genus was established by Dr. Beck on *Helix oparica*, Anton, from the collection made by the late Mr. Cuming at the island of Rapa (Opara), one of the Austral group, a few hundred miles south of Tahiti. There is no doubt as to the identity of the species, although it was described by Dr. Anton as *H. oparica*, from America.

By reason of the similarity between the shells of certain species discovered since and those of the European genus *Discus*, Fitz. = *Patula*, Held., all the Polynesian forms have been described under the European genus; with few exceptions the shells are quite distinct, and the animal decidedly so; they are most numerous at the Hawaiian and Tahitian Islands, less so at the Samoas, and altogether absent in West Polynesia.

The species are quite uniform throughout their whole range. The following are their general characters:—

"Shell orbicular or planorboid, finely radiately ribbed; spire but slightly elevated; last whorl rounded at its periphery and also at the umbilicus, more or less openly umbilicate, rarely imperforate; aperture generally dentate or laminate; radiately striped or tessellated on their upper surface with reddish brown and yellowish, the stripes occasionally taking a zigzag form on the periphery and base; rarely wholly reddish brown; generally covered with a thin epidermis, which, on a few species, supports short hairs."

Only three species, so far as known, are imperforate, and those the smallest of the genus, viz. *imperforata*, Pse., *rotula*, Jacq., and *oparica*, Anton; of the 37 species in the following catalogue, the aperture of 29 is dentate or laminate. The following is the only variation from the type as above:—*H. stellula*, Gld., inhabiting the Hawaiian Islands, is depressed, carinate at the periphery, and strongly ribbed, and of a shining texture.

At the Tahitian Islands a group of species of an aberrant form occur, represented by *H. bursatella*, Gld. They differ from the type in being angulate at the periphery, with the spire more elevated, and the whorls more plain. Their greatest peculiarity, and one by which they may be easily recognized, is the shape of the umbilicus, which becomes at maturity partly covered over by the base of the last whorl, thus becoming cavernous.

Two species have been described from Tahiti and the Hervey Islands, viz. *jacquinoti*, Pfr., and *fratercula*, Pse., which evidently belong to the above group, but are depressed and carinate at the periphery, corresponding in their variation to *stellula*, Gld., at the Hawaiian Islands. I add the following remarks on the synonymy of the species.

PITYS BURSATELLA, Gld.

Of this variable species I have had an opportunity of examining several hundred specimens, and have also received a full series selected from the collections of the American exploring expedition, and from the late Mr. Cuming's type specimens of *H. jacquinoti*, Pfr. The synonymy, as determined by Dr. Gould on the labels of distribution issued by the Smithsonian Institution, and adopted in the following catalogue, is correct, with the exception of *H. oceanica*, Guill., and *H. cavernula*, Jacq. Of the synonyms determined as above, *H. excavata*, Jacq., and *H. coarctata*, Pfr., are pure synonyms of the type; *H. streptaxon*, Roe, is an abnormal form, and *H. turricula*, Jacq., identically the same; *H. oceanica*, Guill., which I exclude from the synonymy, is described as being concavely depressed on its base; and no mention is made of the laminæ in its aperture, which are distinct and could not have escaped notice. Should the determination by Dr. Gould prove to be correct, *H. oceanica*, Guill., should have precedence over *H. bursatella*, Gld., having been described four years previously.

H. jacquinoti, Pfr. (*cavernula*, Jacq.), differs from *P. bursatella*, Gld., or any of its varieties, in being more depressed, acutely carinate at the periphery, without epidermis (surface somewhat shining), its ribs solid, more prominent, extending over the edge of the whorls in a serrated manner, and all the whorls depressedly grooved concentrically at their middle. I have met with no species of its type in collections from the Marquesas, and refer it therefore to Tahiti with a doubt. The only other species of its peculiar form is *P. fratercula*, Pse., inhabiting the Hervey Islands.

PITYS JUGOSA, Migh.

Helix jugosa, Migh. Proc. Boston Soc. 1845, p. 19.

Helix rubiginosa, Gld. Proc. Boston Soc. 1846, p. 171; Am. Exp. Ex. 1852, p. 50, fig. 49.

The above species ranges over all parts of the island of Kauai; it varies in being more or less openly umbilicate, and in the colour being either wholly reddish brown or tessellated with a dusky yellowish colour.

To the above genus I add the following new species:—

PITYS ATIENSIS, Pse.

T. orbicularis, tenuiuscula, aperte umbilicata, radiatim conferte et subarcuatim costulata, supra et infra flavido et rufo tessellato-strigata; spira vix elevata, apice obtuso, sutura bene impressa; anfr. 5, *convexi, ultimus ad peripheriam basinque rotundatus; apertura subcircularis, obliqua; perist. simplex, rectum.*

Diam. 3, alt. 1¾ mill.

Hab. Insula Atiu.

P. modicella (Fér.) is the nearest allied species, from which it differs in being more openly umbilicate, the spire more elevated, and the colours differently disposed.

PITYS ROTELLINA, Pse.

T. planorboidea, solidiuscula, anguste umbilicata, tenuissime radiatim striatula, supra planiuscula, vix elevata, apice depresso: anfr. 6, *plano-convexi, ultimus ad peripheriam basinque rotundatus; apertura obliqua, lunaris, subcompressa, angusta; paries aperturalis lamella unica intrante munitus; perist. simplex, rectum; flavido et rufo alternatim undique strigata.*

Alt. 1, diam. 2 mill.

Hab. Insula Aitutake.

PITYS IMPERFORATA, Pse.

T. imperforata, vel punctiformi-perforata, orbicularis, tenuiuscula, radiatim confertim et tenuissime costulata, flavido et rufo radiatim tessellato-strigata, strigis ad peripheriam basinque flexuosis; spira plano-convexa, apice obtuso, sutura impressa; anfr. 6, *plano-convexi, strictim et lente accrescentes, fere æqualiter, ultimus ad peripheriam rotundatus, basin plano-convexus; apertura obliqua, lunaris, lamellis* 4–5 *munita,* 2 *in pariete aperturali,* 2–3 *in margine basali; perist. simplex; columella callosa, vix eversa.*

Diam 4, alt. 2 mill.

Hab. Insula Aitutake.

Nearest allied to *P. rotula*, Jacq. It has more whorls, is distinctly radiately ribbed, and the reddish stripes extend over the base in zigzag shape.

PITYS RORATONGENSIS, Pse.

T. orbicularis, tenuiuscula, nitidiuscula, aperte umbilicata, radiatim conferte subflexuoso-costulata, flavido et rufo radiatim alternatim strigata, strigis ad peripheriam basinque undulatis; spira vix elevata, apice depresso, sutura bene impressa; anfr. 4½, *rotundato-convexi, leviter accrescentes, ultimus ad peripheriam basinque rotundatus; apertura obliqua, lunaris, lamellis* 4 *munita,* 2 *in pariete aperturali,* 2 *dentiformibus in margine basali; peristoma columellaque simplicia.*

Diam. 2½, alt. 1 mill.

Hab. Insula Roratonga.

PITYS FILOCOSTATA, Pse.

T. discoidea, late umbilicata, tenuiuscula, radiatim oblique et remote filocostata; spira depressa, planulata, sutura bene impressa; anfr. 4, *convexi, ultimus rotundatus, umbilicus* $\frac{1}{3}$ *diametri occupans; apertura vix obliqua, subcircularis; paries aperturalis lamellis* 2 *intrantibus munitus; perist. simplex, rectum; flavido et rufo alternatim strigata, strigis flexuosis, epidermide tenui induta.*

Diam. 4, alt. 2 mill.

Hab. Insula Kauai.

Allied to *P. hystrix*, Migh. It may be distinguished at once by the thread-like character of its ribs, which are remote and shining white when the shell is in good order. It is also smaller, and the whorls are regularly convex. The radiating stripes are curved and flexuous.

PITYS ANALOGICA, Pse.

T. aperte umbilicata, solidiuscula, radiatim forte costata, costis ad peripheriam flexuosis, interstitiis transversim fere obsolete striatis; spira fornicato-convexa, apice depresso, sutura valde impressa; anfr. 7, *rotundato-convexi, lente accrescentes, ultimus ad peripheriam late rotundatus; apertura vix obliqua, semilunaris, lamellis* 7 *coarctata,* 2 *parietalibus,* 3 *basalibus,* 2 *columellaribus; perist. simplex; flavido et rufo irregulariter radiatim strigata.*

Diam $5\frac{1}{2}$, alt. 3 mill.

Hab. Insul. Marquesas.

PITYS VERECUNDA, Pse.

T. planorboidea, tenuiuscula, late umbilicata, radiatim regulariter tenuicostulata, supra planulata, sutura impressa; anfr. 6, *convexi, ultimus ad peripheriam rotundatus, umbilicus fere* $\frac{1}{2}$ *diametri occupans; apertura late lunaris, lamellis* 6 *coarctata,* 2 *parietalibus,* 3 *basalibus, unaque columellari; perist. simplex; flavida, pallide rufo flexuoso-strigata.*

Diam. 5, alt. $1\frac{1}{2}$ mill.

Hab. Insul. Marquesas.

The above two species are the first of the genus discovered on the Marquesan Islands.

Genus ENDODONTA, Alb.

This genus was founded by Dr. Albers on *H. lamellosa*, Fér., which represents a group of species of peculiar characters inhabiting the Hawaiian Islands, and confined to that locality. Most authors have confounded it with *Pitys* (Beck), from which it differs in both shell and animal.

At the Tahitian Islands a group of species occurs nearly related to the above, which are also confined to that locality, none similar having been discovered in any other part of Polynesia. They are peculiar in being loosely coiled, and more widely umbilicate than any other species of *Helicinæ*; they are widely distributed over all the islands, and are more or less nearly related to each other and to the above genus. I note that *acetabulum*, Pse., should be compared to *ficta*, Pse., rather than *obolus*, Gld., as is done by Dr. Pfeiffer. I add the following new species:—

ENDODONTA CELSA, Pse.

T. orbicularis, solidiuscula, late umbilicata, tenuissime radiatim creberrime striatula, rufo et albido pallide tessellata; spira elevata, apice obtusiusculo, nucleus rufescenti-fuscus, sutura bene impressa; anfr. 7, convexi, interdum concentrice elevato-striati, rarissime sulcati aut angulati, ultimus ad peripheriam obtuse angulatus, subtus rotundatus; apertura obliqua, fere circularis, lamella unica in anfr. penultimo munita.

Diam. 7, alt. 3½ mill.
Hab. Insula Raiatea.

Genus MICROCYSTIS.

Microcystis, Beck, Index Molluscorum, 1837, p. 2.

Dr. Beck enumerates six species in illustration of the above genus, three inhabiting the West Indies and three Polynesia. The former are *H. cubensis*, Pfr. = *trifaciella*, Beck (also the type of the genus *Cystycopsis*, Mörch), *H. pellicula*, Fér., locality doubtful, but of West-Indian form, and *H. pictella*, Beck, which remains undetermined. These species are globose in shape, ornamented more or less with coloured bands, of a West-Indian type well-known to collectors.

The Polynesian species are *H. ornatella*, Beck, *adamsii*, Pfr. = *filiceti*, Beck, and *amœnula*, Beck, to which I have lately added a beautiful little species from the Marquesas Islands, viz. *marquesana*, Pse. The above are much smaller than the West-Indian species, and not so globose, excepting the last, and will not, in my opinion, prove to be congeneric with them. They stand as anomalies in the Polynesian fauna, being confined to islands in the extreme easterly portion of Polynesia, and are not represented elsewhere.

It is not improbable that the three species cited by Dr. Beck from Polynesia are varieties of one, as they are all reported from Rapa, a very small island (but 6½ miles long) in the Austral group, about 400 miles south of Tahiti.

Dr. Pfeiffer credits *adamsii*, Pfr., to both Rapa and Pitcairn, which is probably an error. If it occurs at Pitcairn, it is without much doubt distinct from Dr. Beck's species.

Authors have lately extended this genus to embrace a variety of forms, especially a large group of thin, fragile, glassy species, widely distributed over the Polynesian and Papuan Islands, and extending to Australia. They appear to have overlooked the fact that Dr. Beck recognized them as being distinct from *Microcystis*, and arranged them under the generic name of

HELICOPSIS, Beck.

It was injudicious on the part of Dr. Beck to adopt the above name, as it had been used previously by Fitzinger, although the latter proved to be a synonym of *Theba*, Leach. He cites four species as types: the first, *H. corne*, I do not find mentioned by any other author, and has not been published; the three remaining are from Polynesia and agree in their characters, leaving no doubt as to the genus intended; they are *brunnea*, Anton,=*glandula*, Beck, *subtilis*, Anton,=*vitrinella*, Beck, and *orbis*, Beck.

The animal of the species I have had an opportunity of examining is rather slender and elongate, tapering gradually posteriorly to a point, and provided with a glandular opening, slightly raised, at about an equal distance between the extremity of the foot and the shell; the mantle wholly included within the shell. They should therefore be arranged in the family *Stenopidæ*, under the genus *Ariophanta*, rather than *Nanina*.

The species enumerated in the following catalogue vary considerably from the type; their generic relations cannot be determined until the animals have been examined. The columella of the typical species is simple, occasionally slightly everted; in others it is more or less callous, sometimes dentately so, or the callosity is transverse to the columella.

The type is a depressed form, orbicular in shape, either rounded at the periphery or slightly angulate; other species are acutely angulate, assuming a trochiform shape, one form of which M. Mousson has lately separated under the generic name of *Trochonanina*. Other species assume a conical shape, such as *H. cultrata*, Gld., and *conula*, Pse., which would, by some authors, be ranked under the European genus *Conulus*.

Genus TROCHOMORPHA, Alb.

TROCHOMORPHA TROCHIFORMIS, Pfr.

The above is one of several Férussacian species which appear by name in his 'Prodrome,' of which the types are probably lost, as they are not described in his great work on land-shells, nor recorded by M. Deshayes. The first description of the above is that by Dr. Pfeiffer, from a Tahitian species, which is generally accepted as the type, although the locality given by Férussac is the island of Mauritius.

As there is at least a doubt as to the species originally named by Férussac, I think proper to attach the name of Dr. Pfeiffer to the above as author.

I have received several distinct species from collectors under the name *trochiformis*, Fér.

Dr. Pfeiffer's type inhabits the island of Raiatea. It occurs of larger size, and occasionally wholly dark brown or wholly pale yellow; a variety is rarely met with more depressed than the type, of a whitish or pale yellow colour encircled by a single narrow dark brown line or band; base ornamented the same. On the island of Moovea, where the species also occurs, this variety prevails and assumes the size and shape of the type.

On Tahaa, adjoining Raiatea, the type occurs of smaller size and more conical in shape.

The variety referred to above I distinguish by the name of

TROCHOMORPHA TROCHIFORMIS, var. PALLENS, Pse.

Testa plerumque depressior, albida aut pallide straminea, linea unica rufescenti-fusca cingulata.

TROCHOMORPHA NIGRITELLA, Pfr.

The above has been credited by Dr. Pfeiffer to the Sandwich Islands, which is an error. No species of its type or genus inhabits that locality; it is confined to Ponape, Caroline Islands.

A distinct variety occurs so remote from the type that it was returned to me by the late Mr. Cuming marked *H. trochiformis*, Fér. I describe it as

TROCHOMORPHA NIGRITELLA, var. OPPRESSA, Pse.

T. umbilicata, solida, trochiformis, depressa, apice obtusa; anfr. 6–6½, *planiusculi, lente accrescentes, irregulariter oblique tenuistriati, ultimus acute carinatus, basi convexus; apertura securiformis; perist. simplex, incrassatum, interdum marginibus callo junctis; flavescens, juxta suturam fascia rufescenti-fusca cingulata, basi rufescenti-fusca, margine flavescente.*

Diam. 13½, alt. 6 mill.

Hab. Insula Ponape.

The above differs from the type in being more trochiform in shape, with the whorls nearly flat and smoother, and also in colour.

TROCHOMORPHA CONTIGUA, Pse.

Trochomorpha congrua, Pse, Am. Journ. Conch. vol. iv. 1868, p. 154.

Name preoccupied, changed as above.

TROCHOMORPHA EXCLUSA, Hombr. non Fér.

Trochomorpha exclusa, Voy. au Pôle Sud, p. 24, pl. 7. f. 14–17.

The above, collected at the Tahitian Islands, is *Swainsonii*, Pfr., and should not be connected with the Papuan species.

Genus PARTULA, Fér.

Having in preparation a monograph of the above genus in which the distribution and variation of its species will be fully treated of, I merely record descriptions of the following new species:—

PARTULA PELLUCIDA, Pse.

T. oblongo-ovata, anguste perforata, tenuis, pellucida, striis longitudinalibus transversisque granulosa; spira conica; sutura impressa, marginata; anfr. 4½, *plano-convexi, ultimus* ½ *longitudinis testæ haud æquans; apertura verticalis, ovata; perist. subincrassatum, album, vix expansum; columella supra vix dilatata, fere recta; albido-cornea.*

Long. 12, diam. 6½ mill. Apert. long. 5, diam. 3½ mill.

Hab. Guadalcanar, insul. Solomon.

This delicate little species was collected at the above locality by John Brazier, Esq.

It is the nearest allied to *P. minuta*, Pfr. It differs in being more slender, thinner, the spire elongate, the aperture smaller, the surface more distinctly granulose, and the suture marginate.

PARTULA FABA, var. SUBANGULATA, Pse.

T. anguste perforata, dextrorsa, conico- interdum abbreviato-ovata, solida, lævigata, striis incrementi notata, rufescenti-fusca, juxta suturam fascia flavescente cingulata, vel flavescente, fascia fusca ad suturam, interdum omnino straminea aut flavescente aut rufescenti-fusca; anfr. 6, *convexi, ad suturam subangulati, ultimus plerumque tumidiusculus; columella superne tuberculato-callosa, late dilatata; perist. intus callosum, late expansum, margine dextro tuberculato-calloso, superne sinuato, fuscum, callo albido; apertura oblongo-ovalis, subauriformis.*

Alt. 28, diam. 15 mill.

Hab. Insula Tahaa.

The metropolis of *P. faba*, Mart., is on the island of Raiatea; on the adjoining island, Tahaa, it occurs in a modified form, which we distinguish by the above name.

Subfamily SUCCINEINÆ, H. & A. Adams.

Previously to the publication of the report of the American Exploring Expedition but three species of *Succinea* were known as inhabiting Polynesia. At the present time it may rank as the metropolis of the family, not only as regards the number of its species but also types. The number will be much increased, that of the Hawaiian Islands at least four-fold.

It is impossible to define their generic, much more their specific limits, without a knowledge of the animals. However closely the shells inhabiting distant provinces may resemble each other, it will eventually appear that the genera in this family are as local in their distribution as those of the *Helicterinæ*.

The animal of *Succinea picta*, Pfr., inhabiting St. Helena, given by H. and A. Adams as the type, differs certainly from the European genus.

It is also doubtful whether any species of the genus *Helisiga* inhabits Polynesia. I have met with no animal corresponding to the original type of that genus. I would note that the character given to the Hawaiian species arranged under the above genus by H. and A. Adams, viz. "the mantle-margin covering the outer lip," I have not observed, nor does it appear on the figures in the Report of the American Exploring Expedition.

I class for the present all the Polynesian species under the genus *Succinea*, with the exception of two forms at either extreme of the family: the one, *Catinella*, has been heretofore classed with *Oma-*

lonyx; and the other is distinct both as to shell and animal. They are as follows:—

Genus Catinella, Pse.

T. tenuis, fragilis, planulata, depressa, scutellæformis, ovalis; spira minuta, rudimentalis, immersa, subtus concentrice sulcata; apertura perampla, magnitudinem testæ fere æquans.

The type of the above genus is *C. rubida*, Pse. (Journ. de Conch. 1870, p. 97), to which should be added *Succinea explanata*, Gld., both inhabiting Kauai, to which island the genus appears to be restricted.

The animal of the genus *Omalonyx*, inhabiting South America, is described as being semiaquatic in its habits, being found in marshes and dying when removed from the vicinity of the water. The habits of the species of the above genus are quite the reverse. They are strictly arboreal, living on the leaves of banana and other low bushes, and dying when washed by heavy rain down into the axils of the leaves holding water. The shell is attached to the animal by a ligament, for which there is a groove provided around the underside of the spire. It is but loosely attached, and may be removed from the animal while living, without apparent injury. Having unfortunately lost my notes of the animal, its description must be deferred.

Genus Truella, Pse.

Typus, *Succinea elongata*, Pse., Journ. de Conch. 1870, p. 96.

T. elongata, gracilis, tenuis; spira elongata; anfr. celeriter accrescentes; apertura posterior contracta, acuta, antice dilatata; anfr. ultimus postice convolutus.

The above peculiar type has been heretofore only known as inhabiting the Tahitian Islands, where it is represented by *Succinea procera*, Gld., and *S. infundibuliformis*, Gld. A species was unexpectedly discovered on the island of Kauai during the past year, in which the peculiarities of the genus are the most strongly expressed, and which I adopt as the type.

The shell is elongate, slender posteriorly, spire elongate, whorls rapidly enlarging; aperture contracted posteriorly by the convolution of the last whorl.

The animal is slender, tentacles small, cylindrical, gradually tapering to a slightly enlarged tip.

SUCCINEA MAMMILLATA, Pse.

T. tenuiuscula, suboblique ovata, striis incrementi confertim et tenuiter notata, rubella aut succineo-rubescens; anfr. 3, ultimus tumidiusculus, vix obliquus; anfr. spiræ convexi, apice mammillato, sutura valde impressa; apertura oblongo-ovalis, fere recta, labro incrassato, rufo; columella margine callosa, vix arcuata, plica conspicua.

Alt. 12, diam. 7½ mill.

Hab. Insula Nukuhiwa.

The above is the first species described from the Marquesas group of islands.

The shell is rather thin, somewhat obliquely ovate, finely and closely marked by striæ of growth, of a reddish or reddish horn-colour; whorls three, the last slightly swollen and rather oblique; whorls of the spire convex, the apex mammillary, suture strongly impressed; aperture oblong-oval, almost vertical; lip thickened on its edge, red; columella but slightly curved, margin thickened, distinctly plicate posteriorly.

SUCCINEA RUBELLA, Pse.

T. tenuis, subobligue ovata, striis incrementi tenuiter rugosula, succineo-rubescens; anfr. 2½, *ultimus convexus, obliquus; anfr. spiræ rotundato-convexi, apice papillari; sutura bene impressa; apertura fere recta, acute ovata, labro tenui, columella arcuata, margine incrassato; perist. simplex, marginibus callo tenui junctis.*

Alt. 12, diam. 7 mill.

Hab. Insula Lanai.

Genus TORNATELLINA, Beck.

TORNATELLINA GRACILIS, Pse.

T. elongata, gracilis, tenuis, nitida, lævigata, striis incrementi tenuissime notata, fusco-cornea; anfr. 5, *convexi, ultimus planulatus, interdum medio concentrice sulcatus; apertura parva, acute ovata; lamina parietalis valida, prominens; columella forte callosa, tortuosa.*

Alt. 3¾, diam. 1½ mill.

Hab. Insula Kauai.

TORNATELLINA DENTATA, Pse.

T. oblongo-ovata, tenuis, fragilis, nitida, lævigata, fulvo-cornea; anfr. 4½, *convexi; sutura impressa; apertura parva, acute oblongo-ovata; lamina parietalis valida, compressa, prominens; columella forte callosa, tortuosa, vix compressa, medio dente prominente munita.*

Alt. 2½, diam. 1¼ mill.

Hab. Insula Hawaii.

The peculiarity of this little species is, that the columella, in addition to the usual callosity, which in this species is somewhat compressed, is furnished with a prominent tooth on its middle.

Tornatellina striata, Newc., described in Proc. Cal. Acad. 1861, p. 93, I exclude from the genus, transferring it to the genus *Leptachatina*, Gld.

Genus VERTIGO, Müller.

Dr. Gould remarked in his description of *V. tantilla*, in the 'Report of the American Exploring Expedition,' that it was the first species of its type he had met with from Polynesia. It has been discovered since that the species abound on all the islands of the several groups, even on the low sandy Atolls.

So far as known, they may be arranged in three groups, viz.:—first, *V. nitens*, Pse., &c., white, pellucid, nearly smooth; second, *V. lyrata*, Gld., *striatula*, Pse., &c., generally oblong in shape, distinctly ribbed, aperture campanulate, modified by the transverse grooves on last whorl; and third, *V. costulosa*, Pse., more abbreviate in shape, sometimes nearly globular, finely ribbed or elevately striate, and aperture nearly circular.

The following are new species.

VERTIGO STRIATULA, Pse.

T. cylindracea, oblonga, solidiuscula, sinistrorsa, umbilicata, longitudinaliter oblique et flexuose forte costata, interstitiis transversim tenuiter striatis; anfr. 5, *rotundato-convexi, plerumque medio rotundatim angulati, ultimus vix porrectus, medio concentrice late sulcatus, circa umbilicum rotundato-angulatus, basi compressus; apex obtusus; sutura bene impressa; apertura subquadrangularis, basi rotundata, lamellis* 3 *coarctata, in pariete aperturali* 2, *primo magno, cum labro continuo, secundo mediano, interno, in margine columellari superne* 1, *ad labium juncta; peristoma continuum, crassiusculum, vix expansum et reflexum, labro postice sinuoso; rufo-castanea, costis albidis.*

Alt. 2½, diam. 1½.

Hab. Insula Hawaii.

VERTIGO ARMATA, Pse.

T. ovata, vix oblonga, nitidiuscula, dextrorsa, perforata, longitudinaliter tenuissime striata, interdum remote, tenuiter filo-costata, sub lente subtilissime granulosa, fulvescenti-cornea, filis albidis; anfr. 4½–5, *rotundato-convexi; apex obtusus; apertura subquadrangularis, fere circularis, dentibus* 8 *munita, in pariete aperturali* 3, *primo maximo cum labro continuo, secundo mediano, intrante, tertio minimo, interno, in margine columellari* 1, *in marginibus basali et labiali* 4, *profunde sitis; peristoma incrassatum, rufescens, subexpansum, reflexum, marginibus disjunctis, labro postice vix sinuoso.*

Alt. 2, diam. 1¼ mill.

Hab. Insula Bolabola.

VERTIGO SIMPLARIA, Pse.

T. tenuis, obeso-ovata, dextrorsa, rimata, flavescens, longitudinaliter tenuiter striata; anfr. 3, *rotundato-convexi, ultimus planulatus; sutura valde impressa; apex obtusus; apertura fere circularis, edentata; peristoma tenue, marginibus disjunctis; columella superne patula, vix expansa.*

Alt. 1¾, diam. 1 mill.

Hab. Insulæ Marquesas.

VERTIGO COSTATA, Pse.

T. cylindracea, oblonga, solidiuscula, dextrorsa, rimato-perforata,

longitudinaliter flexuose forte costata, rufescens; anfr. 4, *rotundato-convexi, ultimus concentrice valde bisulcatus, basi compressus; apex obtusus; sutura valde impressa; apertura campanulata, basi rotundata, lamellis* 4 *munita, in pariete aperturali* 2, *primo cum labro continuo, secundo mediano, intrante, in margine basali* 1, *labiali postice* 1, *labro flexuoso; peristoma tenue, marginibus disjunctis.*

Alt. 2, diam. 1 mill.

Hab. Insula Hawaii.

VERTIGO PERLONGA, Pse.

T. elongata, cylindrica, rimato-perforata, dextrorsa, pallide straminea, longitudinaliter filo-costata, costis obliquis, remotis, flexuosis; spira obtusa; sutura impressa; anfr. 5, *planulati, ultimus medio concentrice sulcatus, prope basin indentatus; basi compressus, circa umbilicum rotundato-angulatus; apertura subquadrangularis, vix porrecta, basi contracta, rotundata, postice bilamellata, labro superne sinuoso, unilamellata; peristoma continuum vix eversum.*

Alt. $2\frac{1}{2}$, diam. 1 mill.

Hab. Insula Oahu.

VERTIGO DENTIFERA, Pse.

T. cylindrica, solidiuscula, perforata, dextrorsa, longitudinaliter oblique tenuissime striata, rufo- aut flavo-castanea; anfr. 4, *convexo-rotundati, ultimus prope labrum brevi-bisulcatus; apertura fere circularis, postice biplicata, columella uniplicata, basi tri- vel quadridentata, labro vix reflexo; peristoma crassiusculum, non continuum.*

Alt. $1\frac{3}{4}$, diam. 1 mill.

Hab. Insula Roratonga.

VERTIGO COSTULOSA, Pse.

T. obtuso-ovata, interdum fere globosa, tenuis, perforata, dextrorsa, vix nitida, oblique et sparsim filo-costata; anfr. 4, *rotundato-convexi, tumidi, ultimus prope labrum, interdum brevi-bisulcatus; apex obtusus; sutura valde impressa; apertura fere circularis, dentibus* 5–6 *coarctata, in pariete aperturali* 2, *primo juxta labrum, secundo maximo, prominente, lamelliformi, intrante, in margine columellari* 1, *in marginibus basali et externo,* 2–3 *profundo sitis; peristoma subreflexum, crassiusculum, marginibus plerumque callo junctis; rufo- vel flavo-cornea.*

Alt. $1\frac{3}{4}$, diam. 1 mill.

Hab. Insula Hawaii.

VERTIGO BACCA, Pse.

T. cylindracea, abbreviata, tenuiuscula, dextrorsa, perforata, lævigata; apex obtusus; anfr. 4, *rotundati, ultimus concentrice bisulcatus; apertura fere circularis; in pariete aperturali bilamellata, columella unidentata; labrum vix eversum; pallide fusca.*

Hab. Kalapana, Insula Hawaii.

The above description was drawn up several years since from specimens collected at Kalapana, district of Puna, Island of Hawaii; as they have been lost, I furnish the precise locality, to enable collectors to recover the type.

Before leaving this genus I would remark that, of the first type referred to above, three species have been described, viz. *V. nitens*, Pse., *pediculus*, Shutt, and *nacca*, Gld. They are widely distributed, specimens having been received from the following islands:—Apaiang, Ebon, Upolu, Aitutake, Roratonga, Tahiti, Bolabola, Raiatea, Nukuhiwa, Hawaii; they agree in their general characters as to size, shape, texture, and colour, with slight local variations. At some localities they are wholly dextral, at others wholly sinistral. They differ more widely as to the number and position of the teeth in the aperture: usually there are two teeth on the posterior wall of the aperture, which are separate or joined in a bifid manner, rarely but one; the columellar tooth is constant; on the base of the outer lip, generally three, at regular intervals, occasionally but two; and in addition very small rudimentary teeth are rarely met with at different parts of the aperture.

Having received but forty or fifty specimens, I am at present unable to offer a decisive opinion as to the value of the several species.

I note also that *V. tantilla*, Gld., occurs on all the islands of the Tahitian group, and *V. costulosa*, Pse., on all those of the Hawaiian. The species of this genus will prove to be more widely distributed than those of any inhabiting Polynesia.

Operculated Genera.

Genus OMPHALOTROPIS, Pfr.

Since the publication of a monograph of the above genus in 'Journ. de Conch.' 1869, a number of species have been described which confirm the distribution and variation as there given.

The typical form of the genus, the shells of which are carinate or angulate around the umbilicus, more or less ornamented with colours, and of an ovate shape more or less modified, enters Western Polynesia from the East Indies, extending south to the Samoas and thence over the Papuan Islands. Passing east, however, to the Tahitian group and the other islands of Eastern and Southern Polynesia, the genus undergoes a wide variation, so much so that several of the species have been classed with other genera.

Their operculum and animal clearly connect them with the above genus. One of the forms I have distinguished by the subgeneric name *Scalinella*, which may be found faithfully illustrated on Plate 7, Journ. de Conch. 1869. One remaining I now separate under the name of

Subgenus ATROPIS, Pse.

Testa oblonga, interdum cylindracea, rare ovata, imperforata vel anguste perforata, unicolor; apertura ovata, fere circularis;

perist. simplex, continuum, ad anfr. penultimum adnatum aut disjunctum, interdum vix porrectum; anfr. ultimus sæpe ad peripheriam subangulatus.

Animal operculumque gen. Omphalotropis, *Pfr., persimilis.*

The shell of this genus is elongate, sometimes cylindrical, rarely ovate, imperforate, in the species of ovate form narrowly perforate; aperture ovate, occasionally circular; peristome continuous, sometimes disconnected from the penultimate whorl and very slightly porrected. The last whorl is frequently obtusely angulate on its periphery, of one colour, usually pale yellow or reddish.

The species furthest removed from the type of *Omphalotropis*, viz. *A. viridescens*, Pse., and *ventricosa*, Hombr., can scarcely be distinguished from genus *Blanfordia*, A. Ad.; those approaching the nearest, *vescoi*, Dohrn, &c., are of small size, narrowly perforate, abbreviately ovate, but wanting the angulation around the umbilicus. In the following catalogue they are separated from the typical forms.

Genus CYCLOMORPHA, Pse.

Typus, *Cyclostoma flavum*, Brod. P. Z. S. 1832, p. 59.

Testa turbinata, subglobosa, solida, lævigata aut spiraliter striata, perforata; apertura fere circularis; peristoma simplex, subincrassatum, callo tenui continuum.

Operculum ei gen. Omphalotropis, *Pfr. similis.*

The shell of the above genus differs widely from any of the genera of the subfamily *Realiea*, Pfr. From its similarity to those of the genus *Ostodes*, Gld., the species have been heretofore included by Drs. Pfeiffer and Gould in that genus. Having received a number of specimens collected alive with the operculum, I discover it to be certainly related to the above subfamily and to *Cyclostominæ*; while the genus *Ostodes* belongs to the subfamily *Cyclophorinæ*. I also notice that *Ostodes œnomphalus*, Phil., arranged by Dr. Pfeiffer next to *C. flavum*, Brod., and included by Dr. Gould in his genus *Ostodes*, is described as being carinately angulate around the umbilicus, one of the peculiar characters of the genus *Omphalotropis*.

It should be connected with the above genus, serving to confirm its position in the subfamily *Realiea*, Pfr.

Its locality is unknown; the other species inhabit the extreme easterly portion of Polynesia.

Having had an opportunity of examining the operculum of three species of the genus *Ostodes*, I extend the description given by Dr. Gould as follows:—

Genus OSTODES, Gld.

Ostodes, Proc. Bost. Soc. vol. viii. 1861, p. 283.

Operculum tenue, membranaceum, circulare, margine tenuissimo, lacerato; extus fornicato-convexum, nitidum; multispirale; anfr. 8–10, *lente accrescentes, fere æquales; sutura linearis, nucleo centrali; apex vix elevatus, papillatus; subtus regulariter concava.*

Genus Chondrella, Pse.

Typus, *Cyclostoma parvum*, Pse. P. Z. S. 1864, p. 674.

Testa globoso-conica, tenuiuscula, striata, imperforata, vel vix rimata; apertura fere circularis; peristoma simplex, tenue, marginibus late disjunctis; columella callo appresso, late dilatato induta, locum umbilici tegens.

Animal tentaculis nullis, oculis supra caput immersis.

Operculum testaceum, solidiusculum, pallidum, nitidum, oblongo-ovatum, latere dextro fere recto, utrinque rotundatum; extus planum, lævigatum, nucleo obsoleto, marginibus anterioribus et lateralibus angulatis; subtus vix concavum, margine rotunde calloso, quasi costato.

The above genus is peculiar in all respects, animal, shell, and operculum. It should be classed with *Helicinidæ*. It is widely distributed over the islands of Southern Polynesia. Most common at the Hervey group, where Mr. Garrett has had ample opportunity of examining the animal alive. It has positively no tentacles, the eyes being immersed on the head in the situation usually occupied by tentacles.

Cyclostoma minutissimum, Sow., the generic position of which has been undecided, belongs to this genus. It inhabits Pitcairn Island.

Genus Palaina, Semp.

Palaina, Semp. Journ. de Conch. 1865, p. 291.
Pupoidea, Pse. Am. Journ. Conch. 1865, p. 289.

The two genera above are no doubt synonymous. As there appears to be a difference of opinion as regards the relation of this genus to those of the *Diplommatinacea*, by reason partly of a want of knowledge of the characters of its operculum, I furnish the description of that of *P. scalariformis*, Pse., inhabiting the Caroline Islands.

Operculum membranaceum, circulare, multispirale; anfr. 4–5, lente accrescentes, sutura lineari; extus nitidum, medio depresso-concavum, anfr. ultimus rotundatus, margine tenui; subtus vix concavum.

The outer side is regularly concave to the last whorl, which is rounded, so that the operculum when laid down would rest on its margin.

It requires repeated efforts and careful manipulation to separate an operculum, an eighth of a millimetre in diameter, from the animal. If macerated in water until the animal matter becomes soft, the operculum is liable to fall to pieces; while it is impossible to separate it from the animal in a dried state. I have been successful in obtaining the opercula of all the genera inhabiting Polynesia, excepting *Electrina*, Gray, of which I have seen no specimens.

Genus Helicina, Lam.

Under this genus I merely record the following descriptions and synonyms.

The following species, credited to Polynesia, I exclude from the catalogue, viz.:—

H. crassilabris, Phil., does not inhabit the Sandwich Islands.

H. bicolor, Pfr., is credited to Tahiti, which is without much doubt an error, as no species of its size inhabits Polynesia except *H. maugeriæ*, Gray, from which, or any of its varieties, it differs widely.

HELICINA MAUGERIÆ, Gray.

The type of this species is a thick solid shell, rather bluntly angulate at the periphery, and may always be recognized by the colour of its basal callosity, bright yellow, which is persistent; the basal callosity of the variety *H. rubicunda*, Pse., is equally persistent, of a dark red. On both the callosity is very thick.

At the same locality a form occurs which I consider a variety of the above, although it differs rather widely in most of its characters; it is more depressed, acutely angulate at the periphery, white or whitish in colour, encircled above by one or two narrow reddish lines, apex usually pale yellow, and the basal callosity thin and white. I distinguish it by the name of

Var. ALBINEA, Pse.

T. crassa, lenticularis, sublævigata, vix nitida, tenuissime radiatim et arcuatim striata, albida, supra lineis 1–2 *rufescentibus cingulata, infra albida; spira depressa, obtusa, plerumque pallide flavescens; anfr.* 5, *planulati, indistincte marginati; ultimus basi convexus, subtus ad peripheriam distincte marginatus; apertura lunaris, intus pallide straminea; peristoma intus callosum, albidum; callus basalis tenuis, albidus.*

Diam. 12½, alt. 5½ mill.

H. maugeriæ, Gray, and all its varieties, occur only on the island of Raiatea.

HELICINA CALLIOSTOMA, Pse.

T. crassa, globoso-conoidea, tenuissime radiatim striata, omnino pallide straminea aut albida, interdum rufescente fasciata vel maculata; spira vix elevata, conoidalis; sutura bene impressa; anfr. 5–6, *plano-convexi, ultimus ad peripheriam rotundatus, basi convexus; apertura obliqua, lunaris; columella brevis, incrassata, supra vix dilatata, cum perist. angulum acutum formans; peristoma valde incrassatum, interdum duplicatum, album, vix expansum et eversum, marginibus late disjunctis; callus basalis tenuis, parvus, albidus.*

Alt. 7½, diam. 7½ mill.

Hab. Insulæ Marquesas.

The colour of this species is probably much more varied than noted above.

HELICINA TAHITENSIS, Pse.

Helicina pisum (Hombr. non Phil.) Voy. Pôle Sud, vol. v. p. 44, pl. 11. f. 18–22.

T. globoso-conoidea, crassa, tenuissime radiatim striata, omnino straminea aut albida, interdum rufescens, juxta suturam straminea, apex semper straminea; spira conoidea, convexa, obtusa; anfr. 5, *convexiusculi, ultimus ad peripheriam rotundatus vel indistincte angulatus; callus basalis, nitidus, albidus, circumscriptus; apertura fere lunaris; perist. simplex, rectum, incrassatum; columella arcuata, simplex, cum perist. continua.*

Diam. 7, alt. 5½ mill.

The above, collected at the Tahitian Islands, was confounded by M. Hombron with a species inhabiting the Hawaiian Islands described by Dr. Philippi.

HELICINA GUPPYI, Pse.

Helicina humilis (Guppy, non Hombr.), Ann. Nat. Hist. ser. 4, vol. i. p. 434 (1868).

To prevent confusion I alter the name of the above West-Indian species, which was preoccupied for one inhabiting Polynesia.

HELICINA COLORATA, Pse.

Helicina colorata, Pse. Am. Journ. Conch. 1868, p. 156.
Helicina anaaensis, Mouss. Journ. de Conch. 1869, p. 66.

The above is the only species inhabiting the island of Annaa, where it was collected by Mr. Garrett. The above name was given to it by reason of the many variations of colour it passes through. It is wholly whitish, or of different shades of yellow or red, sometimes banded with the same colours; occasionally the last whorl is yellow, and the spire bright crimson.

HELICINA FLAVESCENS, Pse.

Helicina flavescens, Pse. Am. Journ. Conch. 1867, p. 228.
Helicina pacifica, Pse. Am. Journ. Conch. 1865, p. 291.

The redescription of the above species by myself arose from omitting to name the specimens in my collection when first described. I retain the above name as being more appropriate and its description more full.

Genus TAHEITIA.

Taheitia, H. & A. Ad. Ann. Nat. Hist. 1863, p. 19.

The chief and, I may add, the only peculiarity which serves to distinguish the above genus from *Truncatella* is its operculum. The other characters mentioned by Messrs. Adams, viz. the porrection of the last whorl and its being disconnected from the penultimate whorls, are not constant.

Taheitia aurantia, Gld., can scarcely be distinguished from *Truncatella pacifica*, Pse., in any of its characters except the operculum. *Taheitia pallida*, Pse., is also in all respects a *Truncatella* except the operculum.

The East-Indian species *wallacei*, H. Ad., and *clathrata*, H. Ad. & Ang., are more characteristic of this genus than the Polynesian, excepting the type *T. porrecta*, Gld. I am of opinion, however, that several species described as *Truncatella* will prove to belong to the above genus when the operculum is examined.

TAHEITIA SCALARIFORMIS, Rve.

Truncatella scalariformis, Rve. Proc. Zool. Soc. 1842, p. 197.
Truncatella arcticostata, Mouss. Journ. de Conch. 1869, p. 68.

The above was first collected by the late Mr. Cuming at the island of Annaa, and since by Mr. Garrett. It is common about the roots of the cocoa-nut trees, and is the only species of its genus inhabiting the above locality.

TRUNCATELLA CONCINNA, Pse.

T. imperforata, cylindracea, elongata, tenuiuscula, nitida, alba, straminea vel rufo-cornea, confertim et recte costulata, costis in anfr. ultimo circa 31*; anfr. superst.* 4*, plano-convexi, ultimus ad basin cristo-costatus ; apertura subobliqua, ovalis, postice vix angulata ; perist. simplex, continuum, subincrassatum, album, adnatum.*

Long. 7, diam. 2½ mill.

Hab. Insula Apaiang (*Kingsmill*).

The species nearest allied to the above with which I am acquainted is *T. scalariformis*, Rve.

TRUNCATELLA COSTELLIFERA, Pse.

T. crassa, non rimata, elongata, turrito-cylindracea, parum nitens, rubello-flavescens, longitudinaliter costata, costis rectis, compressis, in anfr. ultimo circa 20*; anfr. persistentes* 5*, convexi, ultimus circa basin compresso-costatus ; apertura vix obliqua, ovalis ; perist. simplex, continuum, adnatum ; labrum dextrum acutum, intus vix incrassatum, extus prope marginem fortiter costatum, costa compressa, prominens, circa basin extensa, cum costa umbilicali continua.*

Long. 7, diam. 2½ mill.

Hab. Insula Vavau (*Brazier*).

The chief peculiarity of the above species is the stout rib encircling the outer lip, which continues around the base, connecting with the usual umbilical rib, of even size throughout; there is no trace of an umbilical fissure. It was collected at the above locality by Mr. John Brazier.

Genus PLECOTREMA, H. & A. Ad.

Two species of the above genus inhabit the Hawaiian Islands, viz. *P. striata*, Phil., and *P. clausa*, H. & A. Ad.

Dr. Philippi had probably both species before him when his description was drawn up; that by Dr. Pfeiffer of the same species (Mon. Auric. 1856, p. 104) is more accurate. The description of *P. clausa* by Messrs. Adams agrees more strictly with the form I adopt as the type of that species than the one subsequently published by Dr. Pfeiffer in 'Novit. Conch.' vol. i. p. 15.

As the two species have been confounded by many collectors, I furnish a detailed description of each, drawn up from mature specimens, of which I have had an opportunity of examining a large number.

PLECOTREMA STRIATA, Phil.

Auricula striata, Phil. Zeit. f. Mal. 1846, p. 98.
Plecotrema striata, Pfr. Mon. Auric. 1856, p. 104.

T. crassa, imperforata, globoso-conica, subovata, nigra, spiraliter impresse striata, striis rare inæqualiter distantibus, interstitiis planis, striis remote hispidulis; spira conica, mucronata, convexiuscula; sutura linearis; anfr. 7, ultimus tumidiusculus, ½ longitudinis testæ fere æquans, basi vix attenuatus; apertura fere verticalis, oblonga, postice acuta, vix contracta, basi rotundata, nigricans vel cinereo-nigrescens; plicæ parietales 2, lamelliformes, superior perobliqua, altera extus bifida, valde compressa, elevata, profunde intrans; plica columellaris valida, transversa; peristoma rectum, acutum, marginibus plerumque callo lato tenuissimo junctis, dextro intus, dimidio anteriore et circa basin prope marginem calloso, bidentato; columella extus ad marginem vix elevato-laminata, infra juxta regionem umbilicalem vix crispata.

Dimens. 8 × 5, vel 5 × 3 mill.

Hab. Insula Oahu.

This species is constant in its characters, and distinct from all varieties of *P. clausa*, H. & A. Ad.; the shell is black, solid, engraved concentrically with impressed striæ, which are generally regular; but occasionally one is omitted, leaving the interspaces wider; the interstices are flat; the last whorl is swollen, about one half the length of the shell; the aperture is very slightly oblique, acute posteriorly, more so than in *P. clausa*, and in some specimens constricted, caused by a depression around the upper part of the last whorl near the suture; the lamellæ on the inner lip are oblique, more compressed and prominent than in *P. clausa*, the lower one especially, which passes round far within the aperture; the outer lip on its edge is acute, on its anterior half and around the base, just within the margin, it is slightly callous, on which part the teeth are placed, which are smaller than those in *P. clausa*. The columella is bordered by an elevated lamina; the aperture is blackish or dark cinereous; the teeth and lamellæ white; the striæ are furnished with remote bristly hairs. The characters by which the above may be readily distinguished from *P. clausa* are its black colour, larger size, dark aperture, not being ribbed or lirate but striate, the aperture being more open, the lamellæ on the wall of the aperture compressed and prominent, the teeth on outer lip smaller and the callosity not so thick. These characters are constant, even in specimens of the smallest size.

PLECOTREMA CLAUSA, A. Ad.

T. imperforata, ovato-conoidea, crassa, vix nitidula, spiraliter costulata aut lirata, costis rotundatis, interstitiis setulis munitis et lon-

gitudinaliter tenuiter striatis, pallide fulva vel rufescenti-fusca, rare indistincte fasciata; spira conica, apice acuto, vix mucronato; anfr. 7, planiusculi, ultimus convexus, ½ longitudinis testæ fere æquans, basi vix attenuatus; apertura vix obliqua, oblonga, angusta, ringens, basi anguste rotundata, postice acute angulata; plicæ parietales 2, superior compressa, perobliqua, cum labro callo juncta, altera bifida; plica columellaris compressa, transversa; labrum dextrum extus incrassatum, intus ad marginem valde callosum, fortiter bidentatum; apertura pallida, albida.

Dimens. 5 × 3 vel 4 × 2 mill.

Hab. Insula Hawaii.

This species is rare; it is distinctly roundly ribbed, and the teeth of the aperture are very strongly developed. It varies considerably, the grooves becoming narrower and the interspaces taking a flattened lirate shape. The grooves and striæ of this and *P. striata* are furnished with remote hairy bristles, which fall off when they become dry, and are therefore seldom preserved on cabinet specimens. The largest specimens, lirate and of a reddish colour, are usually mistaken for *P. striata*, Phil. This species never attains to the size of *P. striata*, and is never black.

The species inhabiting the Island of Bourbon and registered by M. Deshayes in his work on the Mollusca of that island as *P. striata*, Phil., with a doubt, agrees with the type of the above species. I find, on comparison, no characters to separate them.

LAIMODONTA CONICA, Pse.

Laimodonta conica, Pse. Proc. Zool. Soc. 1862, p. 242; Am. Journ. Conch. 1861, p. 101, pl. 12. f. 15.

Laimodonta anaaensis, Mouss. Journ. de Conch. 1869, p. 63, pl. 5. f. 1.

The above was originally described from specimens collected in Central Polynesia. It was afterwards discovered by Mr. Garrett at the Island of Annaa, where it attains to a larger size. It varies in colour; but the other characters of the shell are identically the same in both localities.

MELAMPUS MUCRONATUS, Gld.

Melampus mucronatus, Gld. Proc. Bost. Soc. 1849; Rep. Am. Exp. Ex. 1852, p. 204, fig. 242.

Ellobium oryza, H. & A. Ad. Proc. Zool. Soc. 1854, p. 8.

Auricula oryza, Pfr. Mon. Auric. 1856, p. 141; Novit. Conch. vol. i. p. 28, pl. 7. f. 17–19.

I have received from Annaa fifty or more specimens of *M. oryza*, H. & A. Ad., the only species of its type inhabiting that small atoll, and type specimens of *M. mucronatus*, Gld., from the collection of the American Exploring Expedition, found at Raraka, a short distance from Annaa.

The two are synonymous, although the descriptions vary. The Raraka specimens have more colour, and are rather smaller. The most essential difference between the two descriptions is, that *M. oryza* is described as having but three plaits on its outer lip, while *M. mucronatus*, Gld., has eight; the plaits decrease in size as they recede from the base, so that on many specimens the posterior ones are quite small or become obsolete; the mucronation is indistinct on most specimens, the basal striæ constant. I would add to the descriptions that the spire is very finely striate longitudinally, and the last whorl slightly depressed posteriorly, giving the spire a slender appearance. The species is certainly distinct, and not a variety of *M. luteus*, Quoy, as suggested by Dr. Gould. The latter species I have in all stages of growth from the same locality.

The following synonym was omitted above.

ATROPIS PRODUCTA, Pse.

Realia producta, Pse. Proc. Zool. Soc. 1864, p. 673.
Hydrocea raiatensis, Mouss. Journ. de Conch. 1869, p. 67.
Hab. Insulæ Raiatea et Tahaa.

On comparison of a large number of specimens, the above will be found to vary considerably. The type is represented on the island of Bolabola by *A. bolabolensis*, Dohrn, and at Tahiti by *A. terebralis*, Gld. *A. elongata*, Pse., inhabiting Raiatea, is more distantly related to it.

Catalogue of Genera and Species.

The whole number of species of land-shells known as inhabiting Polynesia is 626.

In the following Catalogue the *Helicterinæ* are omitted, a list having been lately published in the Society's 'Proceedings' (1869, p. 644), to which but one species has been added since.

The genera and number of species of each are as follows:—

INOPERCULATA.

Helicterinæ, 223.
Vitrina, Drap., 2.
Succinea, Drap., 26.
Truella, Pse., 3.
Catinella, Pse., 2.
Carelia, H. & A. Ad., 6.
Chloræa, Alb., 1.
Tornatellina, Beck, 18.
Lamellina, Pse., 2.
?*Bulimus*, Scop., 2.
Stenogyra, Shutt, 5.
Partula, Fér., 63.
Vertigo, Müll., 19.
Rhysota, Alb., 1.
Hyromia, Risso, 1.
Trochomorpha, Alb., 21.
Endodonta, Alb., 10.
Pitys, Beck, 33.
Microcystis, Beck, 4.
Helicopsis, Beck, 30.
?*Helix*, Linn., 10.

OPERCULATA.

Diadema, Pse., 3.
Cyclophorus, Mont., 1.
Ostodes, Gld., 5.
Registoma, Hass., 1.
Pupina, Vign., 1.
Palaina, Semp., 15.
Moussonia, Semp., 1.
Cyclostomus, Mont., 1.
Omphalotropis, Pfr., 16.
Atropis, Pse., 18.

Scalinella, Pse., 3.
Cyclomorpha, Pse., 2.
Assiminea, Gray, 5.
Helicina, Lam., 37.
Chondrella, Pse., 3.
Electrina, Gray, 1.
Truncatella, Risso, 3.
Taheitia, H. & A. Ad., 4.

AURICULIDÆ.

Cassidula, Fér. 1.
Pythia, Bolt., 3.
Plecotrema, H. & A. Ad., 2.
Melampus, Mont., 15.
Laimodonta, H. & A. Ad., 2.
Pedipes, Adans., 1.
Blauneria, Shutt., 1.

Inoperculata	482
Operculata	120
Auriculidæ	25
Total species	627

The localities given may be relied on as correct, all report to the contrary notwithstanding. Such as are doubtful are so marked. A few of the species occur on more than one island; of such I have given what I suppose to be the original locality, or the one which may be regarded as the metropolis of the species at present.

The generic position of a few species of *Helices* is not determined; they have been arranged provisionally under the genus *Helix*. Species of aberrant form are classed under the genera to which they are the nearest related, separated by asterisks.

INOPERCULATA.

Subfamily VITRININÆ.

VITRINA, Drap.
fusca, *Pse.* Marquesas.
subviridis, *Pse.* Marquesas.

Subfamily SUCCINEINÆ.

SUCCINEA, Drap.
bernardia, *Recl.* ?Tahiti.
canella, *Gld.* Maui.
caduca, *Migh.* Oahu.
cepulla, *Gld.* Hawaii.
costulosa, *Pse.* Tahiti.
crocata, *Gld.* Upolu.
fragilis, *Soul.* Hawaii.
gouldiana, *Pfr.* Tahiti.
guamensis, *Pfr.* (pacifica, *Beck.*). Guam.
humerosa, *Gld.* (tahitensis, *Pfr.*). Tahiti.
labiata, *Pse.* Raiatea.
lumbalis, *Gld.* Hawaii.
mamillata, *Pse.* Marquesas.
manuana, *Gld.* Manua.
modesta, *Gld.* Upolu.
newcombiana, *Garr.* Hawaii.
pallida, *Pfr.* Tahiti.

SUCCINEA
?pudorina, *Gld.* Tahiti.
patula, *Migh.* Oahu.
putamen, *Gld.* Upolu.
punctata, *Pfr.* Hawaii.
papillata, *Pfr.* Tahiti.
rotundata, *Gld.* (aperta, *Lea*; newcombii, *Pfr.*). Oahu.
rubella, *Pse.* Lanai.
venusta, *Gld.* Hawaii.
vesicalis, *Gld.* Hawaii.

TRUELLA, Pse.
elongata, *Pse.* Kauai.
infundibuliformis, *Gld.* Tahiti.
procera, *Gld.* Moovea.

CATINELLA, Pse.
explanata, *Gld.* Kauai.
rubida, *Pse.* Kauai.

Subfamily ACHATININÆ.

CARELIA, H. & A. Ad.
bicolor, *Jay.* Kauai.
  var. adusta, *Gld.* Kauai.
  var. angulata, *Pse.* Kauai.
cumingiana, *Pfr.* Kauai.

CARELIA
fuliginea, *Pfr.* Kauai.
paradoxa, *Pfr.* Kauai.
turricula, *Migh.* Kauai.
variabilis, *Pse.* Kauai.
var. olivacea, *Pse.* Kauai.
var. viridans, *Pse.* Kauai.

TORNATELLINA, Beck.
achatinoides, *Pfr.* Marquesas.
antonii, *Pfr.* Rapa.
aperta, *Pse.* Tahiti.
conica, *Mouss.* Upolu.
dentata, *Pse.* Hawaii.
globosa, *Petit.* Rapa.
gracilis, *Pse.* Kauai.
hidalgoi, *Crosse.* Marquesas.
newcombii, *Pfr.* Kauai.
nitida, *Pse.* Ebon.
oblonga, *Pse.* Tahiti.
ovata, *Anton.* Rapa.
peponum, *Gld.* Kauai.
philippii, *Pfr.* Tahiti.
pusilla, *Gld.* Matea.
simplex, *Pse.* Tahaa.
trochlearis, *Beck* (pellucida, *Mühl.*). Rapa.
turrita, *Anton.* (archimedes, *Beck*; subulata, *Anton*). Rapa.

LAMELLINA, Pse.
lævis, *Pse.* Tahiti.
serrata, *Pse.* Ebon.

Subfamily BULIMINÆ.

?BULIMUS, Scop.
argutus, *Pse.* Tahiti.
turgidus, *Pse.* Tahiti.

STENOGYRA, Shutt.
beckianus, *Pfr.* (oryza, *Desh.*; vitreus, *Mühl.*). Rapa.
junceus, *Gld.* Kauai. (upolensis, *Mouss.* Upolu.)
oparanus, *Pfr.* Rapa.
pyrgiscus, *Pfr.* Oahu.
tuckeri, *Pfr.* Mangareva.

PARTULA, Fér.
affinis, *Pse.* Tahiti.
abbreviata, *Mouss.* Tutuila.
amabilis, *Pfr.* Tutuila.
annectens, *Pse.* Tahiti.
assimilis, *Pse.* Roratonga.
attenuata, *Pse.* Tahiti.
bilineata, *Pse.* Tahiti.
bicolor, *Pse.* Guam.
brazieri, *Pse.* Tutuila.
canalis, *Mouss.* Upolu.
var. semilineata, *Mouss.* Tutuila.

PARTULA
calypso, *Semp.* Peleliu.
callifera, *Pfr.* Raiatea.
citrina, *Pse.* Raiatea.
clara, *Pse.* Tahiti.
compacta, *Pse.* Raiatea.
compressa, *Pfr.* Raiatea.
conica, *Gld.* Upolu.
crassilabris, *Pse.* Raiatea.
dentifera, *Pfr.* Raiatea.
elongata, *Pse.* Moovea.
erhelii, *Morelet.* Moovea.
extensa, *Pse.* Tutuila.
faba, *Mart.* Raiatea.
var. subangulata, *Pse* (australis, *Brug.*; ? bulimoides, *Lesson*). Tahaa.
fragilis, *Terr.* Guam.
fusca, *Pse.* Raiatea.
garrettii, *Pse.* Raiatea.
ganymedes, *Pfr.* (fasciata, *Pse*). Marquesas.
gonochila, *Pfr.* ? Samoas.
gibba, *Ferr.* (mastersii, *Pfr.*). Guam.
gracilis, *Pse.* Raiatea.
guamensis, *Pfr.* (brumalis, *Rve*). Ponape.
hebe, *Pfr.* Raiatea.
var. bella, *Pse.* Raiatea.
hyalina, *Brod.* Tahiti.
leucothoe, *Semp.* Peleliu.
lineata, *Less.* Oualau.
lignaria, *Pse.* Tahiti.
lilacina, *Pfr.* Marquesas.
lineolata, *Pse.* Tahiti.
lutea, *Less.* Bolabola.
lugubris, *Pse.* Raiatea.
nodosa, *Pfr.* Tahiti.
var. trilineata, *Pse.* Moovea.
ovalis, *Pse.* Raiatea.
producta, *Pse.* Tahiti.
planilabrum, *Pse.* Tahaa.
radiolata, *Pfr.* Guam.
recta, *Pse.* Marquesas.
rosea, *Brod.* Huaheine.
rubescens, *Rve.* Tahiti.
rufa, *Less.* Oualau.
rustica, *Pse.* Raiatea.
simplaria, *Morelet.* Tahiti.
solidula, *Rve.* Tahaa.
stolida, *Pse.* Raiatea.
striolata, *Pse.* Moorea.
strigata, *Pse.* Marquesas.
tahitana, *Brug.* (auriculata, *Brod.*; tahulana, *Anton*). Tahiti.
thetis, *Semp.* Peleliu.
varia, *Brod.* Huaheine.
var. glutinosa, *Pfr.*
var. pulchra, *Pse.*
var. simplex, *Pse.*
variabilis, *Pse.* Raiatea.

PARTULA
vexillum, *Pse.* Moorea.
vittata, *Pse.* Raiatea.
umbilicata, *Pse.* Tahaa.
zebrina, *Gld.* Upolu.
var. recluziana, *Petit.* Tutuila.

Subfamily PUPINÆ.

VERTIGO, Müll.
admodesta, *Migh.* Oahu.
armata, *Pse.* Bolabola.
bacca, *Pse.* Hawaii.
costata, *Pse.* Hawaii.
costulosa, *Pse.* Kauai.
dentifera, *Pse.* Roratonga.
dunkeri, *Zel.* Tahiti.
hyalina, *Zel.* Tahiti.
lyrata, *Gld.* Oahu.
nacca, *Gld.* Hawaii.
newcombii, *Pfr.* Hawaii.
nitens, *Pse.* Ebon.
paivæ, *Crosse.* Mangareva.
pediculus, *Shutt.* Marquesas.
var. samoensis, *Mouss.* Upolu.
perlonga, *Pse.* Oahu.
pleurophora, *Shutt.* Marquesas.
simplaria, *Pse.* Marquesas.
striatula, *Pse.* Hawaii.
tantilla, *Gld.* Tahiti.

Subfamily HELICINÆ.

CHLORÆA, Alb.
pelewana, *Mouss.* Pelews.

RHYSOTA, Alb.
sowerbyana, *Pfr.* (hogoleuensis, *Guill.*; pachistoma!, *Jacq.*) Hogoleu.

HYGROMIA, Risso.
similaris, *Ferr.* Oahu.

TROCHOMORPHA, Alb.
approximata, *Guill.* (marmorata, *Jacq.*). Hogoleu.
cressida, *Gld.* Raiatea.
contigua, *Pse.* Ponape.
entomostoma, *Jacq.* Hogoleu.
eurydice, *Gld.* Upolu.
goniomphala, *Pfr.* Ponape.
kusteri, *Pfr.* Tahiti.
navigatorum, *Pfr.* Samoas.
nigritella, *Pfr.* Ponape.
var. oppressa, *Pse.* Ponape.
swainsonii, *Pfr.* (exclusa, *Hombr.*; vahine, *Hombr.*). Raiatea.
subtrochiformis, *Mouss.* Upolu.
tentoriolum, *Gld.* Upolu.
tuber, *Mouss.* Upolu.

TROCHOMORPHA
trochiformis, *Pfr.* Raiatea.
var. pallens, *Pse.* Moorea.
troilus, *Gld.* Upolu.
velata, *Jacq.* Hogoleu.

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alta, *Pse.* Ponape.
rectangula, *Pfr.* (hapa, *Hombr.*). Marquesas.

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obconica, *Pse.* Raiatea.
schmeltziana, *Mouss.* Upolu.
var. usurpata, *Mouss.* Savaii.
tais, *Hombr.* Marquesas.

ENDODONTA, Alb.
binaria, *Pfr.* Kauai.
lamellosa, *Fér.* (frickii, *Pfr.*). Oahu.
laminata, *Pse.* Kauai.
rugata, *Pse.* Mani.

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acetabulum, *Pse.* Raiatea.
celsa, *Pse.* Raiatea.
fabrefacta, *Pse.* Raiatea.
ficta, *Pse.* Raiatea.
huaheinensis, *Pfr.* Huaheine.
obolus, *Gld.* Tahiti.

PITYS, Beck.
analogica, *Pse.* Marquesas.
atiensis, *Pse.* Atiu.
bilamellata, *Pfr.* Rapa.
capillata, *Pse.* Kauai.
complementaria, *Mouss.* Upolu.
consimilis, *Pse.* Tahiti.
contorta, *Fér.* (intercarinata, *Migh.*). Oahu.
dædalea, *Gld.* Metia.
decussatula, *Pse.* Molokai.
filocostata, *Pse.* Kauai.
gradata, *Gld.* Opolu.
græffii, *Mouss.* Upolu.
hystrix, *Migh.* Oahu.
hystricella, *Pfr.* Kauai.
hystricelloides, *Mouss.* Upolu.
imperforata, *Pse.* Roratonga.
jugosa, *Migh.* (rubiginosa, *Gld.*). Kauai.
modicella, *Fér.* Tahiti.
oparica, *Anton.* Rapa.
parvidens, *Pse.* Tahiti.
radiella, *Pfr.* (pardalina, *Desh.*; undulata, *Ferr.*). Rapa.
rotellina, *Pse.* Aitutake.
rotula, *Jacq.* Mangareva.
roratongensis, *Pse.* Roratonga.
sexlamellata, *Pfr.* Mangareva.
stellula, *Gld.* Mani.
verecunda, *Pse.* Marquesas.

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PITYS

bursatella, *Gld.* (coarctata, *Pfr.*; excavata, *Jacq.*; streptaxon, *Rve.*; turricula, *Jacq.*). Tahiti.
fratercula, *Pse.* Roratonga.
heynemannii, *Pfr.* Tahiti.
jacquinotii, *Pfr.* (cavernula, *Jacq.*). ?Tahiti.
oceanica, *Guill.* Tahiti.
retunsa, *Pse.* Tahiti.

MICROCYSTIS, Beck.

marquesana, *Pse.* Marquesas.
ornatella, *Beck.* Rapa.
amœnula, *Beck.* Rapa.
adamsii, *Pfr.* (filiceti, *Beck.*) ?Rapa.

?HELIX, Linn.

alata, *Pfr.* Lanai.
caperata, *Gld.* (newcombii, *Pfr.*). Kauai.
distans, *Pse.* Kauai.
depressiformis, *Pse.* Tahiti.
exæquata, *Gld.* Kauai.
oualauensis, *Pse.* Oualau.
prostrata, *Pse.* ?Lanai.
tenella, *Gld.* Kauai.
tiara, *Migh.* Kauai.
exserta, *Pfr.* Hawaiian Islands.

Family STENOPIDÆ.

HELICOPSIS, Beck.

aurulenta, *Beck.* Pitcairns.

HELICOPSIS

chamissoi, *Pfr.* Kauai.
cicercula, *Gld.* Hawaii.
electrina, *Hombr.* Guam.
firmostyla, *Mouss.* Uvea.
fornicata, *Gld.* Kauai.
frivola, *Pse.* Oualau.
kauaiensis, *Pfr.* Kauai.
lardyi, *Charp.* Rapa.
minutalis, *Fér.* Tahiti.
normalis, *Pse.* Moorea.
orbis, *Beck.* Rapa.
pauxillus, *Gld.* Maui.
pertenuis, *Gld.* Aurora.
samoa, *Hombr.* Upolu.
samoensis, *Mouss.* Upolu.
simillima, *Pse.* Tahiti.
striolata, *Pse.* Ebon.
subtilis, *Anton.* Rurutu.
subtilissima, *Gld.* Maui.
subrutila, *Migh.* Kauai.
verticillata, *Pse.* Moorea.
venosa, *Pse.* Roratonga.

Columella dentata vel callosa.

callifera, *Pfr.* Marquesas.
conula, *Pse.* Raiatea.
cultrata, *Gld.* Tahiti.
cryptoportica, *Gld.* Oahu.
ensifera, *Mouss.* Samoa.
perpolita, *Mouss.* Upolu.
upolensis, *Mouss.* Upolu.

OPERCULATA.

Family CYCLOPHORIDÆ.

Subfamily CYCLOTINÆ.

DIADEMA, *Pse.*

biangulata, *Pse.* Atiu.
parva, *Pse.* Roratonga.
rotilla, *Pse.* Roratonga.

Subfamily CYCLOPHORINÆ.

? CYCLOPHORUS, Mont.

incisus, *Hombr.* Hogoleu.

OSTODES, Gld.

adjunctus, *Mouss.* Tutuila.
obligatus, *Gld.* Metia.
plicatus, *Gld.* Upolu.
var. strigatus, *Gld.* (apiæ, *Récl.*; pulverulentus, *Phil.*; albidus, *Hombr.*). Upolu.
tiara, *Gld.* Upolu.
upolensis, *Mouss.* Upolu.

Subfamily PUPININÆ.

REGISTOMA, Hass.

complanatum. *Pse.* Ebon.

PUPINA, Vign.

difficilis, *Semp.* Peleliu.

PALAINA, Semp.

alata, *Semp.* Nermaleh.
dohrnii, *Semp.* Palaas.
dimorpha, *Semp.* Peleliu.
inflatula, *Semp.* Peleliu.
lamellata, *Semp.* Kreiangel.
patula, *Semp.* Peleliu.
polymorpha, *Semp.* Peleliu.
pupa, *Semp.* Peleliu.
pusilla, *Semp.* Peleliu.
pyramis, *Semp.* Peleliu.
ringens, *Semp.* Peleliu.
strigata, *Semp.* Peleliu.
scalariformis, *Pse.* Ponape.
striolata, *Semp.* Aibukut.
wilsoni, *Semp.* Aibukut.

MOUSSONIA, Semp.
typica, *Semp.* Upolu.

Subfamily CYCLOSTOMINÆ.

? CYCLOSTOMUS, Mont.
carolinensis, *Pfr.* Carolines.

OMPHALOTROPIS, Pfr.
bifilaris, *Mouss.* Upolu.
var. gracilior, *Mouss.* Tutuila.
var. teretiformis, *Mouss.* Samoas.
bilirata, *Mouss.* Upolu.
var. elongata, *Mouss.* Upolu.
bulimoides, *Hombr.* Hogoleu.
cheynei, *Dohrn.* Pelews.
conoidea, *Mouss.* Upolu.
var. angulosa, *Mouss.* Savaii.
erosa, *Quoy.* Guam.
fragilis, *Pse.* Ebon.
guamensis, *Pfr.* Guam.
huaheinensis, *Pfr.* Huaheine.
lævis, *Pse.* Ponape.
navigatorum, *Pfr.* Samoa.
ovata, *Pse.* Mangaia.
parvula, *Mouss.* Upolu.
perforata, *Mouss.* Uvea.
variabilis, *Pse.* Atiu.
zebriolata, *Mouss.* Upolu.

ATROPIS, *Pse.*
affinis, *Pse.* Aitutake.
albescens, *Pfr.* Rapa.
bolabolensis, *Dohrn.* Bolabola.
elongata, *Pse.* Raiatea.
oblonga, *Pfr.* Marquesas.
producta, *Pse* (raiatensis, *Mouss.*). Raiatea.
rubella, *Pfr.* Marquesas.
scitula, *Gld.* Tahiti.
scherzeri, *Zel.* Tahiti.
solidula, *Pfr.* Marutu.
terebralis, *Gld.* Tahiti.
ventricosa, *Hombr.* Tahiti.
viridescens, *Pse.* Huaheine.

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abbreviata, *Pse.* Tahiti.
exigua, *Hombr.* Mangareva.
insularis, *Crosse.* Mangareva.
ochrostoma, *Pse.* Aitutake.
vescoi, *Dohrn.* Tahiti.

SCALINELLA, Pse.
costata, *Pse.* Tahaa.
scalariformis, *Pse.* Atiu.
tahitensis, *Pse.* Huaheine.

CYCLOMORPHA, Pse.
flava, *Brod.* Annaa.
margarita, *Pfr.* Rapa.

ASSIMINEA, Gray.
dubia, *Pfr.* Rapa.
lucida, *Pse.* Annaa.
nitida, *Pse.* Tahiti.
parvula, *Mouss.* Upolu.
pupoides, *Anton.* (oparica, *Pfr.*). Rapa.

Family HELICINIDÆ.

HELICINA, Lam.
albolabris, *Jacq.* Tahiti.
beryllina, *Gld.* Tutuila.
var. flavida, *Mouss.* Tutuila.
calliostoma, *Pse.* Marquesas.
corrugata, *Pse.* Raiatea.
colorata, *Pse.* (anaaensis, *Mouss.*). Annaa.
discoidea, *Pse.* Tahiti.
exigua, *Jacq.* Mangareva.
flavescens, *Pse.* Roratonga. (pacifica, *Pse.* Mangaia.)
fulgora, *Gld.* Samoa.
humilis, *Jacq.* Hogoleu.
interna, *Mouss.* Savaii.
inconspicua, *Pfr.* Tahiti.
kusteriana, *Pfr.* Tahiti.
lenticularis, *Sow.* ? Pacific Islands.
laciniosa, *Migh.* Kauai.
maugeriæ, *Gray.* Raiatea.
var. rubicunda, *Pse.* Raiatea.
var. albinea, *Pse.* Raiatea.
miniata, *Less.* Bolabola.
minuta, *Sow.* Rapa.
musiva, *Gld.* Samoa.
multicolor, *Gld.* Tahiti.
oceanica, *Pse.* Apaiang.
parvula, *Pse.* Atiu.
pazi, *Crosse.* Mangareva.
pisum, *Phil.* Oahu.
plicatilis, *Mouss.* Upolu.
rotelloidea, *Migh.* (bronniana, *Phil.*). Oahu.
rohrii, *Pfr.* (marchionissa, *Jacq.*). Marquesas.
rustica, *Pfr.* Tahiti.
rugulosa, *Pse.* Tahaa.
sandwichensis, *Soul.* Oahu.
solidula, *Gray.* Toau.
tahitensis, *Pse* (pisum, *Hombr.*). Tahiti.
trochlea, *Gld.* Metia.
uberta, *Gld.* (constricta, *Pfr.*). Kauai.
villosa, *Anton.* Rapa.
zigzag, *Pse.* Oualau.
zonata, *Less.* Oualau.

CHONDRELLA, Pse.
parva, *Pse.* Tahiti.
minutissima, *Sow.* Pitcairn.

Chondrella
striata, *Pse.* Roratonga.

Electrina, Gray.
succinea, *Sow.* Rapa.

Family Truncatellidæ.

Truncatella, Risso.
concinna, *Pse.* Apaiang.

Truncatella
pacifica, *Pse.* Oualau.
valida, *Pfr.* Samoa.

Taheitia, A. Ad.
pallida, *Pse.* Tahiti.
porrecta, *Gld.* Tahiti.
scalariformis, *Rve.* (arcticostata, *Mouss*). Annaa.
vitiana, *Gld.* Samoa.

Auriculidæ.

Cassidula, Fér.
crassiuscula, *Mouss.* Upolu.

Pythia, Bolten.
acuta, *Hombr.* Hogoleu.
pantherina, *A. Ad.* Nueniona.
var. uveana, *Mouss.* Uvea.
savaiiensis, *Mouss.* Savaii.

Plecotrema, H. & A. Ad.
clausa, H. & A. Ad. Hawaii.
striata, *Phil.* Oahu.

Melampus, Mont.
? ater, *Mühl.* Ponape.
castaneus, *Mühl.* Molokai.
fasciatus, *Desh.* Ponape.
frickii, *Pfr.* Oahu.
lucidus, *Pse.* Oahu.
luteus, *Quoy.* Ponape.
mucronatus, *Gld.* Raraka. (oryza, *H. & A. Ad.* Annaa.)

Melampus
philippii, *Kust.* Marquesas.
parvulus, *Nutt.* Oahu.
semiplicatus, *Pse.* Oahu.
semisulcatus, *Mouss.* Upolu.
striatus, *Pse.* Tahiti.
tæniola, *Hombr.* Mangareva.
violus, *Less.* Bolabola.
zonatus, *Mühl.* Marquesas.

Laimodonta, H. & A. Ad.
conica, *Pse* (anaaensis, *Mouss.*). Annaa.
bronni, *Phil.* (sandwichensis, *Soul.*).

Pedipes, Adans.
sandwichensis, *Pse.* Hawaii.

Blauneria, Shutt.
gracilis, *Pse.* Oahu.

The following description was omitted above:—

Chondrella striata, Pse.

T. globoso-conica, tenuiuscula, imperforata, dextrorsa, spiraliter elevato-striata, fulvida aut rufo-cornea; anf. 3, convexi, ultimus subventricosus; spira obtusa, sutura impressa; apertura rotundato-ovata; labrum simplex, tenue; columella fere recta, callo superne late dilatato.

Alt. $1\frac{3}{4}$, diam. $1\frac{1}{4}$ mill.

Hab. Insula Roratonga.

The above may be distinguished from *C. parva*, Pse., in being striate. It is also of smaller size.

The first specimens of the above genus forwarded to London were supposed by Mr. H. Adams to be the young of some species of *Realia*; they resemble more nearly the young of *Assiminea.* They may be at once distinguished from either by the columellar callosity.

May 16, 1871.

Prof. Flower, F.R.S., in the Chair.

The Secretary read the following report on the Additions to the Society's Menagerie during the month of April 1871.

The total number of registered additions to the Society's Menagerie during the month of April 1871 was 215, of which 13 were by birth, 99 by presentation, 92 by purchase, two by exchange, and 9 were received on deposit. The total number of departures during the same period by death and removals was 100, showing a net addition of 115 individuals to the collection during the month.

The most noticeable additions were the following:—

1. A female of the new Deer which I have lately described and figured as *Cervus alfredi* (P. Z. S. 1870, p. 381, pl. xxviii.), received in exchange April 1st. This animal closely resembles the male in general appearance (except in the absence of horns), and is of very great interest, as confirming the validity of the species. I have also positive information as to its locality, this animal having been brought to England direct from the Philippines. Having a special article in preparation on this and the other known Deer of the Philippine Islands, I will defer saying more on this subject at present.

2. A second young one of the Collared Fruit-bat (*Cynonycteris collaris*), born in the Gardens, April 7th, and produced by the same pair as the former one, born in February last year (see P. Z. S. 1870, p. 127). The first young, which is a male, is still alive and doing well, keeping closely in company with its parents, and rather away from the other Fruit-bats in the same cage.

3. A young female Spider Monkey, purchased April 11th. This animal was obtained at Colon by an officer of the R. West-Indian Mail Co., and was stated to have been brought from the Atrato river by one of the American party now engaged on the survey of the isthmus for a ship-canal. It is of a uniform black, with the whole under surface of the belly pale fulvous, which colour, however, hardly extends on to the under surface of the limbs. The face and muzzle are flesh-colour. The hair is rough and upstanding, and appears to project forward on the forehead. It has no traces of an external thumb. It would appear to belong to the same group as *Ateles variegatus*, Wagner, but has no traces of a frontal band, or of white hairs on the sides of the face. I have been a little doubtful about this specimen, but on the whole am inclined to refer it to *Ateles vellerosus*, Gray*, with which it agrees more nearly than with any other described species.

4. A Geoffroy's Marmoset (*Midas geoffroii*†), purchased April 11th, having been brought from Colon along with the *Ateles* just mentioned. Of this beautiful species, of which I exhibit a sketch

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* *Ateles vellerosus*, Gray, P. Z. S. 1865, p. 733; Cat. Monkeys, p. 44.

† *Hapale geoffroii*, Puch. R. Z. 1845, p. 336.

(Plate XXXVIII.) and the skin and skull (for the animal has since unfortunately died), specimens have, I believe, been once before living in the Society's Gardens. On "Sept. 26, 1857," I find entered in our register of accessions two "Titi Monkeys, presented by Julius Brenchley, Esq." These were determined by the then Secretary, Mr. Mitchell, as *Midas ursulus* *, but were, I have no doubt, *Midas geoffroii*, as the skin of one of them is now in the gallery of the British Museum, labelled as having been received from this Society about the same date under the name of the "*Titi* Monkey." Mr. Brenchley, in reply to inquiries on the subject, tells me that he obtained these animals "from the forests of New Granada, near the coast." Other specimens of this *Midas* in the British Museum were obtained by Mr. Salvin's collector Arcé at Chepo on the isthmus of Panama, so that there can be no doubt of this being its true locality.

5. Four Nose-horned Vipers, *Vipera nasicornis* (Shaw)†, presented by William Cleaver, Esq., of Cape-Coast Castle, West Africa, April 13th. Mr. Cleaver, writing March 17, informs me that three of these are "young specimens out of a batch of 21 born at Cape-Coast Castle some few days ago—thus proving that the species is viviparous."

6. A Rat-tailed Serpent from Sta. Lucia (*Trigonocephalus lanceolatus*), presented by G. W. Des Vœux, Esq., C.M.Z.S., Administrator of the Government of the island. I am not aware that any example of this much-dreaded scourge of the West-India Islands has been previously brought to England alive.

The receipt of this and the previously mentioned donation renders our series of the true Venomous Serpents very full, as it now embraces specimens of *Viperæ nasicornis, rhinoceros,* and *arietans, Cenchris piscivorus, Trigonocephalus lanceolatus, Crotalus horridus* and *C. lecontei,* besides the Elapine forms *Naia hadje* and *N. tripudians.*

7. Two Kiwis, purchased April 14th, one being of the ordinary species *Apteryx australis*‡, and the other *Apteryx owenni.* As there remained only a single specimen of *Apteryx* (of the latter species) living in the Society's collection, this addition to our series is a very acceptable one.

8. A Bay Lynx (*Felis rufa*), said to have been brought from Mexico, purchased April 15th. This animal has very slender ear-pencils. A specimen previously in the Society's collection (purchased 26th June, 1868) with which it otherwise agrees, and of which I exhibit a sketch, is absolutely destitute of these appendages, and has caused me some perplexity, as I was not previously aware that the ear-tufts were ever absolutely deficient in any Lynx.

9. A pair of the little Hanging-Parrakeet of the Philippines (*Loriculus culacissi*), purchased April 24; and

10. An example of the Blue-crowned Parrot (*Tanygnathus luco-*

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* Report of Council of the Z. S. 1858, p. 16.

† Strauch, Mém. Ac. St. Pét. ser. 7. vol. xiv., Syn. d. Vip. p. 88.

‡ *Vide infrà*, p. 496.

nensis) of the same islands. Both these beautiful species are new and welcome additions to the Society's extensive collection of living Psittacidæ.

A paper was read by Dr. P. Martin Duncan, M.B. Lond., F.R.S., F.G.S., Professor of Geology to King's College, London, &c., entitled "A Description of the Madreporaria (Stony Corals) dredged up during the expedition of H.M.S. 'Porcupine' in 1869 and 1870.

This paper, which was communicated to the Society by Prof. Huxley, will be printed in the Society's 'Transactions.'

An extract was read from a letter addressed to the Secretary by Dr. R. A. Philippi, C.M.Z.S., Director of the National Museum of Santiago, dated Santiago, March 28th. In reply to inquiries of Mr. Sclater, Dr. Philippi stated that *no Tortoise whatever had yet been found in Chili,* and that the Tortoises forwarded to the Society from Santiago, upon which *Testudo chilensis* of Dr. Gray had been founded, had been, as already anticipated by Mr. Sclater (P. Z. S. 1870, p. 667, and Ann. Nat. Hist. ser. 4. vol. vi. p. 470), collected by Mr. Weisshaupt in the vicinity of Mendoza, Argentine Republic. Under these circumstances Mr. Sclater observed that the correct name of this Tortoise would be *Testudo argentina,* as suggested by him in the above-mentioned article in the 'Annals of Natural History.'

Monsieur Charles Dode, of St. Petersburg, exhibited specimens of some remarkable animals that he had collected during his recent travels in the Amour country, among which were particularly noticed specimens of the Long-haired Tiger (*Felis tigris,* var. *amurensis*), and of the Ounce (*Felis uncia*). M. Dode also exhibited four specimens of the Red-breasted Goose (*Bernicla ruficollis*) from Astrabad, on the borders of the Caspian Sea, and examples of some beautiful new species of birds recently discovered in Turkestan, the most noticeable of which were *Turdus mystacinus, Passer ammodendri,* and *Pyrrhula incarnata.*

M. Dode made the following remarks on these specimens:—

FELIS TIGRIS, var. AMURENSIS.

Cette espèce féline qui habite sur les bords du fl. Amour et du fl. Oussouri présente quelques différences avec le *Felis tigris bengalensis* ; poils plus longs, couleur moins foncée, bandes noires moins prononcées. Sans être très-commun, on le rencontre assez fréquemment soit dans les vastes forêts vierges qui bordent le fleuve, soit dans les grands roseaux des bords des lacs. Cette espèce féline, qui est propre aux tropiques, n'émigre pas et supporte très-bien les vingt et vingt-cinq degrés de froid que ces contrées ont à supporter pendant deux à trois mois et quelquefois plus. Les conditions d'habitat semblent aussi avoir eu une influence très-grande sur les mœurs de ce félin ;

son caractère semble être devenu moins féroce que celui du tigre du Bengale ; il n'attaque jamais, poursuivi il fuit, et ne se défend que lorsqu'il est blessé à mort. Il est à regretter que les vastes solitudes où il habite ne permettent pas d'étudier les mœurs d'une manière spéciale.

FELIS UNCIA.

Cette espèce est assez commune dans le Turkestan où les peaux mal dépareillées du reste se vendent assez cher aux Chinois. Le spécimen que j'en ai rapporté provient des bords du fl. Amour et semblerait, d'après les dispositions des taches, être une variété du *Felis uncia* que l'on rencontre aux Indes et dans le Turkestan.

PASSER AMMODENDRI.

Cette jolie espèce de passereau a été trouvée par M. Severtzow naturaliste Russe dans les montagnes Célestes sur des plateaux d'un accès difficile ; les seules données qui m'aient été communiquées, c'est que pendant l'hiver qu'on se trouve, cet oiseau ne descend pas dans la plaine.

TURDUS MYSTACINUS.

D'après les renseignements recueillis M. Severtzow, qui a étudié ce genre sur plus de 100 exemplaires, a constaté que la différence qui existe avec le *Turdus atrogularis* n'est pas une différence d'âge ou de sexe. C'est un oiseau de montagne dont les mâles descendent peu dans la plaine, où (en hiver) la principale récolte a été faite. Tous les *T. mystacinus* ne sont pas facile à reconnaître de *T. atrogularis* du même sexe ; leurs variations individuelles sont très-considérables, et quelquefois il en existe qui font hésiter pour leur détermination. Mais, ce qui est sûr, c'est que la coloration de la gorge et du jabot du *T. mystacinus* présente des différences individuelles bien plus considérables que ses variations d'âge, qui ont été anatomiquement reconnues aux organes sexuels, à la pneumaticité des os, à la dureté des tendons. Ayant égard à cela, l'auteur doute de la distinction spécifique, qui serait cependant évidente, si les caractères des exemplaires expédiés à l'étranger étaient constantes, mais ils ne le sont que dans certaines limites ; il y a :

1°. Le pur type *T. mystacinus* ; les mâles adultes la gorge également fauve, encadrée de deux rangées latérales de taches noires, formant moustache ; mais beaucoup plus de noir à la gorge et au jabot que leurs femelles, toutes les taches noires étant plus fortes.

2°. Le pur type *T. atrogularis*, dont je possède les deux sexes.

3°. Beaucoup d'intermédiaires, tous femelles, à plastron clair de la gorge tellement tacheté, que ces mouchetures se confondent presque avec les moustaches, mais cependant plus claires que le jabot.

The following papers were read :—

1. On Speke's Antelope and the allied Species of the Genus *Tragelaphus*. By Sir Victor Brooke, Bart., F.Z.S., F.R.G.S.

[Received May 3, 1871.]

(Plate XXXIX.)

Some confusion apparently existing between three of the larger known species of the genus *Tragelaphus*, it has occurred to me as not entirely useless to review their history, and to endeavour to lessen the confusion, by giving characters of distinction between the species which may prevent similar mistakes in future.

In the 'Proceedings' of this Society for 1864 (p. 103, plate xii.) Dr. Sclater described and figured provisionally an Antelope, of which the horns attached to part of the frontal bones of an adult, and the skin and horns of a young male, had been brought from Karagué by Captain Speke, on his return from the Victoria Nyanza. In the 'Proceedings' of the same year (p. 649) Dr. Kirk expressed his opinion that the "*Nakong*" of the marshy regions of Lake N'gami and the Chobe was identical with the "*Nzoe*" of Karagué, the *T. spekii* of Sclater.

Dr. Sclater, being very desirous to throw as much light as possible on the history of this little-known and most interesting Antelope, subsequently collected some MS. notes on the subject, which he intended to form into a supplementary paper, more fully describing the species and its allied forms. These notes, however, he has lately, in the most generous manner, placed in my hands for consideration, knowing my special interest in this branch of zoology. Amongst these papers are two letters, one from Dr. Livingstone, the other from Mr. Oswell. Both of these gentlemen express themselves satisfied as to the identity of the "*Nakong*," procured by them during their visit to Lake N'gami in 1852, with the "*Nzoe*" obtained by Capt. Speke in equatorial Africa. In a letter which I have just received from Mr. Oswell, relative to the habits of the "Nakong" of Southern Africa, he remarks, "The colour of male and female is alike, a rusty blackish-brown; hair long and shaggy. This Antelope is scarce, in small families, though I am told more abundant on the swamps of the Teoghe river, N.W. of N'gami, and is not, I think, found short of the point where the Zouga river issues from the lake. It lives entirely in the swamps and reeds; and its feet are wonderfully adapted to its habitat; their extreme length and area of tread, including the fetlock up to the succentorial hoofs, make them perfect 'swamp-shoes,' though they incapacitate the animal from running on hard ground. When pressed, the Nakong takes to the water, and sinks itself altogether save the nostrils; in this position it is often speared by the natives." Mr. Oswell adds, "my description must only be taken for what it is worth, as I think I only saw a Nakong once, and the description of their hiding in the water, and inability to run on hard ground are entirely from native accounts."

Mr. Oswell has also most kindly, and I fear at considerable inconvenience, forwarded me for comparison the specimen brought by him from Lake N'gami.

The Nakong is mentioned by Mr. Baines in his 'Explorations in S.W. Africa' (p. 458), also by Mr. Andersson in his 'Lake N'gami' (p. 449). The latter brought home a damaged skin, and a sketch of the head, which he submitted to Dr. Gray for identification; but that gentleman naturally, owing to the meagre materials at that time at his command, expressed himself "unable to determine its exact nature, but seemed inclined to consider it identical with *Tragelaphus euryceros*" (see 'Lake N'gami,' p. 449).

Being very desirous to arrive at some definite conclusion concerning this Antelope and the two species of *Tragelaphus*, viz. *T. euryceros* and *T. angasii*, with which, I have reason to believe, it has been occasionally confounded, I have lately made a very careful examination and comparison of all the heads and skins belonging to these three species that I could get access to, both in the British Museum and elsewhere; and I must express my obligation to Dr. Gray for the courtesy with which he has afforded me every facility for examining the specimens under his care, and to Mr. Gerrard for the very great patience with which he has assisted me in that examination.

I will now describe the characters by which I believe the skulls and horns, the materials most commonly presented to our judgment in the case of the rarer Antelopes, may be, in case of the three species under consideration, at all times distinguished from each other. For the full description of *T. spekii*, see P. Z. S. 1864, p. 103; for that of *T. angasii*, P. Z. S. 1848, p. 89; and for that of *T. euryceros*, Proc. Soc. Nat. Hist. Bost. 1852, p. 299.

In the accompanying drawings, figs. 1 and 2 (pp. 486, 487) represent heads in my own collection, which specimens I have the pleasure of submitting for examination this evening. Fig. 3 (p. 488) is taken from the type specimen of *T. euryceros* in the British Museum, the skulls having unfortunately been destroyed in the case of my own specimens of this Antelope.

It will be seen that there is a most remarkable difference in size between these three Antelopes, *T. euryceros* being, roughly speaking, as much larger than *T. angasii* as that species is larger than *T. spekii*—the difference between *T. euryceros* and *T. spekii* being about equal to that existing between a Wapiti and a Fallow Deer.

The difference of mere size is so great that, had it been duly observed, it would have been, I think, impossible for confusion to have taken place between Antelopes differing so widely in this and many other features.

For the purpose I have in view, it is unnecessary to go into osteological details; but there are also, as may be observed, considerable differences in the form of the skulls—the most remarkable of which is, perhaps, the breadth of *T. euryceros* across the cheeks, a measurement taken from the most laterally projecting parts of the maxillæ bearing a much larger relative proportion to the general width of the skull in this than in the two other species.

The horns of these Antelopes, though bearing a strong family likeness, are, if looked at carefully, very easily distinguishable from each other.

The strength, decision, and spiral twist of the keels, standing as they do in inverse ratio to the size of the three species, give a widely different character to the horns at all ages, especially when we compare the massive and rather short horns of *T. euryceros* with the long, graceful, slender horns of *T. spekii*.

In colour and external surface the horns of *T. angasii* and *T. spekii* differ considerably, those of the latter, in all the specimens I have examined, being of greenish-brown colour, the annulations wide apart, smooth, and polished, with the posterior of the two keels which encircle the horns very strongly raised during its entire course, running strongly outwards as it nears the points of the horns, where it dies away. In *T. angasii* the horns are black, the annulations rough and closely set, and the posterior keel, though well marked at all ages, is much more indistinct and undecided than in *T. spekii*.

Between the horns of *T. euryceros* and *T. angasii* there exists so wide a difference that, if once their respective characters are observed, they cannot be mistaken for each other.

Besides the very great massiveness of the former, the anterior keel is almost, in some cases quite, obsolete, the surface of the horns, as in those of *T. spekii*, being greenish brown and very smooth, contrasting strongly with the black, crisp annulations of *T. angasii*.

My chief object in entering so particularly into the differences observable in the skulls and horns of these Antelopes is, in some degree, to substantiate the following interesting conclusion, relative to the distribution of *Tragelaphus spekii*, at which I have arrived after my observations on the subject. In the 'Proceedings' of this Society for 1848 (p. 88), there is a notice of an Antelope obtained by Capt. Allen during the Niger expedition at Kokki, on a small tributary (the Abo) of the Cameroons river, in the Bight of Biafra. In the Appendix to the 'Narrative of the Expedition to the Niger,' in 1841, vol. ii. p. 488, I find a reference to the same Antelope, with the statement that "Mr. Ogilby believed the horns to have been taken from *A. euryceros*; but Mr. Mitchell, the Secretary of the Zoological Society, and Mr. Waterhouse, thought they might have belonged to an entirely new and undescribed species." The skull and horns of this individual are now, and have been for many years, in the British Museum. The specimen is mentioned in Dr. Gray's Catalogue of the Mammalia of the British Museum (p. 137) as var. 1 of *Tragelaphus euryceros*. I have most carefully examined it, and have compared it with the type of *Tragelaphus spekii*, with the specimen of that Antelope in my own collection (fig. 1, p. 486), with a specimen in the British Museum, composed of the skin, horns, and feet, which specimen Mr. Layard recognizes as one sent by him from South Africa to M. Verreaux, and which passed from M. Verreaux into the British Museum, and with a frontal bone and horns brought by Mr. Green from Lake N'gami, and presented to the British Museum. The result of this comparison is, that I have no doubt that all these specimens belong to one and the same species. With respect to the Biafra specimen, I am confirmed by Capt. Allen's remarks on the subject. He says (P. Z. S. 1848, p. 88), "It was, I should think, about 3 feet high, or rather more, of a darkish brown colour." The locality where he obtained it he describes as "pestiferous and foggy," most truly characteristic of the resorts of this remarkable animal.

In still further corroboration of this opinion, I find a horn in the British Museum that I consider unquestionably to belong to this species, labelled "(*Parzudaki*) Gaboon," also a skin, horns, and feet, beyond any doubt of a Speke's Antelope, which specimen Mr. Gerrard informs me was sent by M. du Chaillu from Gaboon, in 1865, to Mr. John Murray of Albemarle Street, and brought by Mr. Gerrard from Mr. Murray's to the British Museum. Should the distribution of an Antelope so specially adapted to a life amongst swampy and marshy regions be found to extend from the Victoria Nyanza on the east to the Cameroon and Gaboon country on the west, and thence to Lake N'gami on the south, it will, I think, be a matter of some interest, as it will indicate the probability that large parts of unexplored equatorial Africa are suitable to the habits of this lake- and swamp-loving Antelope.

The following diagnoses* will, I hope, afford characters for distinguishing these three species of *Tragelaphus*:—

A. Hair of sides smooth and short, striped with white bands, descending from a white dorsal streak. Hoofs short.
    a. General colour deep chestnut; stripes strongly marked, numerous. Horns smooth, massive. Neck, back, and belly maneless. Tail bovine. Fore limbs with dark markings anteriorly .... *T. euryceros.*
    b. General colour dark bluish grey; stripes few, faintly marked. Horns rough, moderate. Neck, back, and belly maned. Tail cervine and hairy. Fore limbs rich tan below the knees .... *T. angasii.*
B. Hair of sides coarse and long, without stripes. Hoofs long.
    c. General colour rusty brown. Neck maned. Horns smooth, slender, strongly keeled. Hair of sides and body of uniform length .... *T. spekii.*

The synonymy of these three species, so far as I have been able to examine it, appears to stand as follows:—

1. TRAGELAPHUS SPEKII.

1848. *Antelope from Bight of Biafra*, Allen, P. Z. S. 1848, p. 88.

1850. *Strepsiceros*, sp. ?, Turner, P. Z. S. 1850, p. 171.

1852. *Tragelaphus euryceros*, var. 1, Gray, Cat. Mam. B. M. 1852, p. 137.

1856. *Nakong*, Andersson, Lake N'gami, p. 449.

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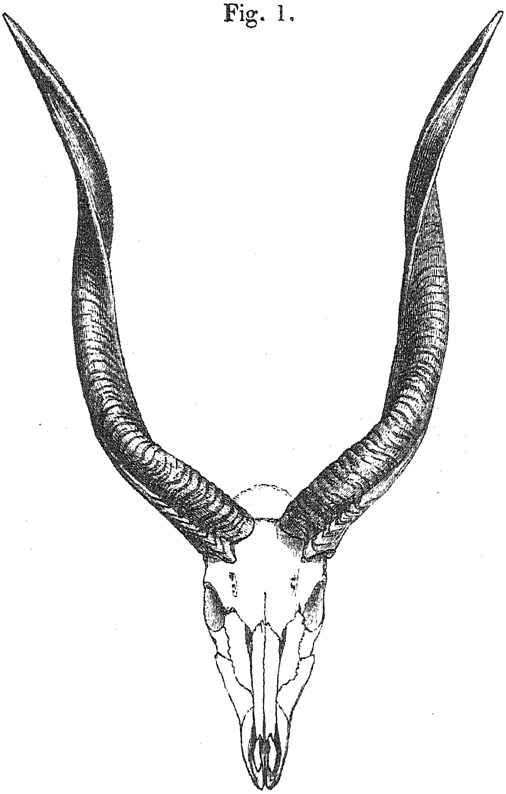
* These diagnoses only apply to the males of each species, the females of *T. euryceros* and *angasii* being unknown.

1861. *Tragelaphus euryceros*?, Layard, Cat. Mamm. Afric. Mus. 1861, p. 79.
1864. *Tragelaphus spekii*, Sclater, P. Z. S. 1864, p. 103.
1864. *Nakong*, Baines, Expl. S. W. Africa, p. 458.

Fig. 1.



Head and horns of *Tragelaphus spekii*, from specimen *g* of list.

Exact Localities and Authorities.

Bight of Biafra (*Allen*); Lake N'gami (*Oswell*, in litt.); Karagué (*Speke*).

List of Specimens examined.

a. Type specimen of *T. spekii*, Sclater. Mus. Brit.

b. Skull and horns from Bight of Biafra. Mus. Brit.

c. Frontal bone and horns (*T. angasii*, *a*, in Cat. of the Bones in Brit. Mus. Gray, p. 246). Mus. Brit.

d. Single horn in Mus. Brit. (*T. euryceros*, *f*, Cat. Bones B. M. p. 246).

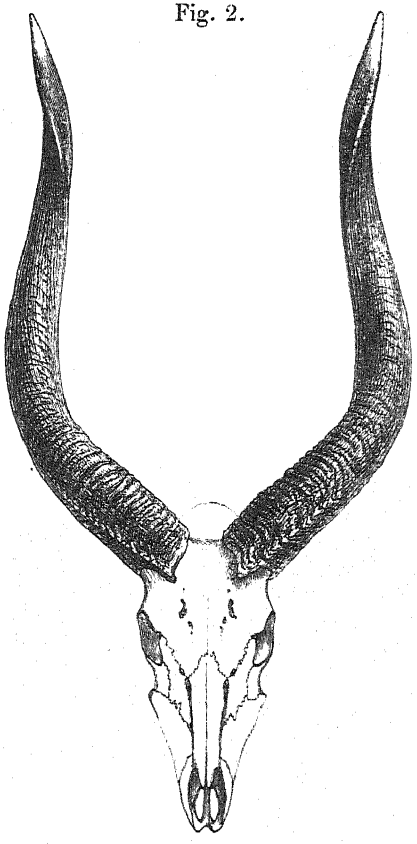
e. Skin with feet, frontal bone, and horns, "*Du Chaillu*, Gaboon." Mus. Brit.

f. Skin with feet, skull, and horns, from M. Verreaux. Mus. Brit.

g. Skull, with horns attached. In my own collection.

h. Frontal bone, horns, and foot. In the collection of Mr. Oswell.

Fig. 2.



Head and horns of *Tragelaphus angasii*, from specimen *d* of list.

2. TRAGELAPHUS ANGASII.

1848. *Tragelaphus angasii*, Gray, P. Z. S. 1848, p. 89.

1850. *Tragelaphus angasii*, Gray, Knowsl. Menag. p. 27, and P. Z. S. 1850, p. 144.

1850. *Strepsiceros angasii*, Turner, P. Z. S. 1850, p. 171.

1850. *Tragelaphus angasii*, Proudfoot, P. Z. S. 1850, p. 199.

1852. *Tragelaphus angasii*, Gray, Cat. Mamm. Brit. Mus. 1852, p. 137.

1854. *Inyala*, Baldwin, African Hunting, 1854, p. 76.

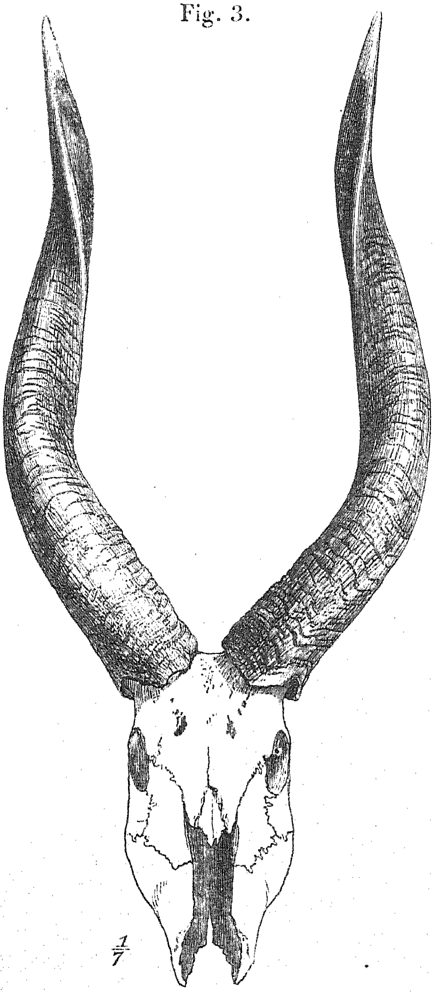
Exact Localities and Authorities.

Mapoota River (*Proudfoot*); St. Lucia Bay (*Angas, Baldwin*).

List of Specimens examined.

a. ♂ & ♀. Horns and skin. Mr. Fellows's collection.
b. Skin and horns, Mr. Eastwood, Pongi river. Mus. Brit.
c. Skin, skull, and horns. Mus. Brit. Locality?
d. Skull and horns. In my own collection.

Fig. 3.



Head and horns of *Tragelaphus euryceros*, from specimen *b* of list.

3. **TRAGELAPHUS EURYCEROS.** (Plate XXXIX.)

1836. *Antilope euryceros*, Ogilby, P. Z. S. 1836, p. 120.
1850. *Tragelaphus euryceros*, Gray, Knowsley Menag. p. 27, t. xxiii. f. 1, and P. Z. S. 1850, p. 144.
1850. *Strepsiceros euryceros*, Turner, P. Z. S. 1850, p. 171.
1860. *Tragelaphus albo-virgatus*, Du Chaillu, Proc. Soc. Nat. Hist. Boston, 1860, p. 299.
1861. *Tragelaphus albo-virgatus*, Du Chaillu, Expl. Equatorial Africa, p. 306.
1861. *Tragelaphus euryceros*, Gray, P. Z. S. 1861, p. 276.

Exact Localities and Authorities.

Ashkankoloo Mountains, 60 miles south of the equator, 140 miles from the coast (*Du Chaillu*).

List of Specimens examined.

a. Frontal bone and horns (*T. euryceros*, *b*, Cat. Bones B. Mus. p. 126).
b. Skull and horns. Type specimen of *T. euryceros*. Mus. Brit.
c. Skin and skull of young male, figured Plate XXXIX. Mus. Brit.
d. Frontal bone and horns exhibited. In my own collection.
e. Frontal bone and horns. in my own collection.

2. Notes on rare or little-known Animals now or lately living in the Society's Gardens. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.—Part II.* Birds.

[Received May 13, 1871.]

26. **BUCEROS CORRUGATUS**, Temm.

In my notice of the Hornbills received from Malacca and Sumatra, (P. Z. S. 1870, p. 220), I identified one of them as *Buceros gracilis* of Temminck (Pl. Col. 535), having omitted to notice that this is merely the female of *B. corrugatus* of Temminck (Pl. Col. 531), as has been pointed out by Schlegel, Mus. de P.-B. *Buceros*, p. 9. We have once before had a male specimen of this fine species of Hornbill in the Gardens (see P. Z. S. 1868, p. 261).

27. **BUCEROS SUBCYLINDRICUS**, Sclater, P. Z. S. 1870, p. 668, pl. xxxix.

Mr. Sharpe has lately furnished me with skins of *B. cylindricus* and *B. fistulator* from his collection, which have enabled me to make a closer comparison between them and the bird recently described under the name above given from the specimen living in our Gardens.

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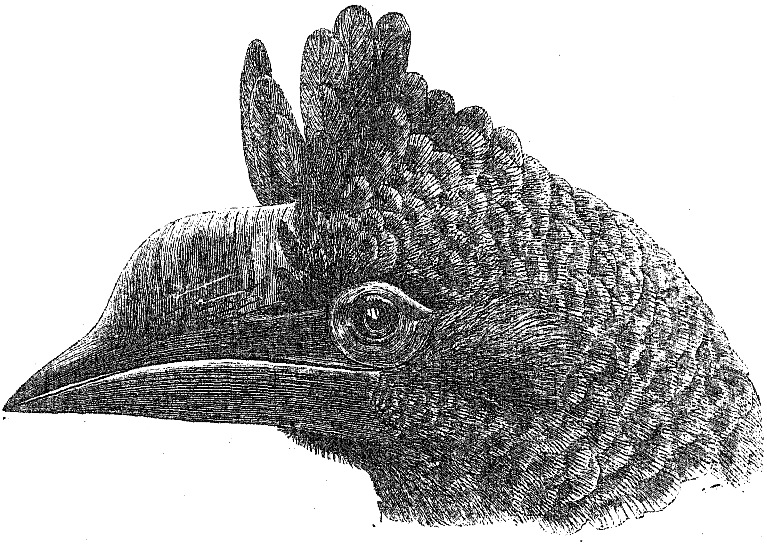
* For Part I., Mammals, see *antea*, p. 221.

Fig. 1.



Head of *Buceros subcylindricus.*

Buceros cylindricus is at once distinguishable by the peculiar form of the elevated casque, which is correctly figured by Temminck (Pl. Col. 521. fig. 2), and by the white tail being completely crossed by a black median band. Our bird, as regards the form of its bill, is, as shown by the sketch, much nearer to *B. fistulator*; but the culmen is more elevated than in *B. fistulator*, and the lower mandible not so strong. Moreover, in *B. fistulator* the culmen and tip and the base of the lower mandible are white; in our bird the whole bill is black. Again, in *B. fistulator* there are no signs of the terminal edgings on the crest, and the outer secondaries are black instead of white.

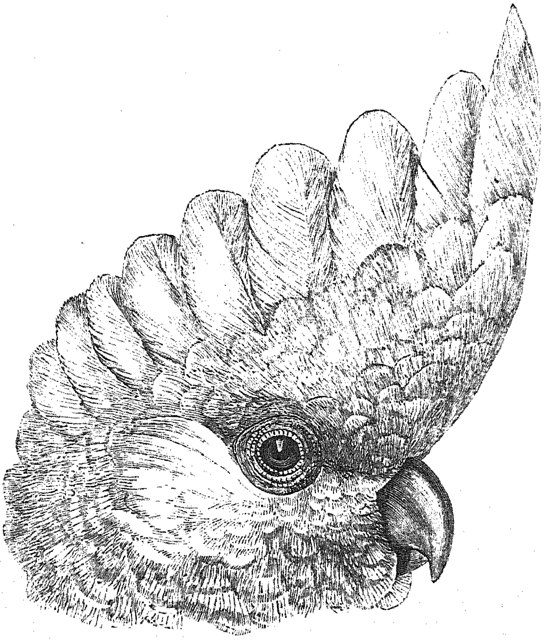
As far as I can at present make out, *B. subcylindricus* is distinct from both of these and from every other described species.

28. CACATUA GYMNOPIS, sp. nov.

We have now placed next together in the Parrot-house three living specimens of three nearly allied species of the group of smaller white Cockatoos, the determination of which has caused me some little trouble, though they are obviously very distinct.

In the first of these birds (fig. 2), purchased April 11, 1864, being one of the individuals described in my notice, P. Z. S. 1864, p. 187, and figured pl. xvii., there is no trace whatever of red colour on the face. The naked skin round the eye is nearly circular in form and of a pale blue colour; the basal part of the crest-feathers is reddish orange, with a slight tinge of lemon-yellow towards their summit, which colour, however, is hardly seen unless the crest is elevated. The wing- and tail-feathers are likewise stained in the inner webs with pale lemon-colour. This bird I take to be *Cacatua ducorpsi*, as already pointed out in my article above referred to, and as also determined by Dr. Finsch, who himself saw and examined the two examples of this bird which we originally received (*cf.* Finsch, Papag. i. p. 311).

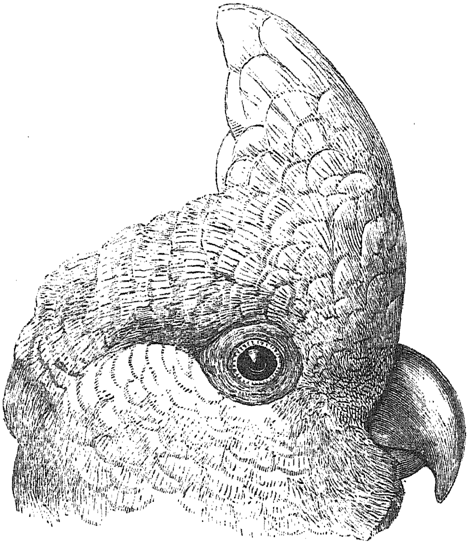
Fig. 2.



Head of *Cacatua ducorpsi.*

In the second bird (fig. 3), which we obtained by purchase on the 25th November, 1865, the lores and front are tinged with reddish, and the crest is of a different shape from that of *C. ducorpsi*, having its front feathers much more elongated than those immediately behind them, so that when erected the crest is more pyramidal in form. The naked space round the eye is nearly circular as in *C. ducorpsi*, but white and not bluish. The crest-feathers are rosy at their bases, and there is no yellow in the crest; the inner webs of the wing- and tail-feathers are lemon-yellow. This bird I identify as *Cacatua sanguinea*, Gould, from Northern Australia, agreeing as it does in nearly every respect with his figure and with Dr. Finsch's excellent description (*l. s. c.* p. 307).

Fig. 3.



Head of *Cacatua sanguinea.*

The third of our smaller white Cockatoos has also the lores and front reddish, nearly as in *C. sanguinea*; but the usual naked space round the eye is largely extended into a bare open space below it, as shown in the accompanying figure (fig. 4), and is of a much deeper blue than in *C. ducorpsi*. In this respect the bird resembles *Licmetis nasica* more than any other *Cacatua*. The crest resembles in shape that of *C. sanguinea* above spoken of. The feathers on the head, neck, and partly on the belly are tinged with rosy red at their bases.

We purchased this bird of Mr. Jamrach on the 2nd of June, 1868. I determined it as *C. goffini* of Finsch, and so entered it in the register*; but after again going into the subject I am convinced that it cannot be that bird. Dr. Finsch gives as his diagnosis of *C. goffini* (Papag. p. 309), "*loris rubris nullis,*" which cannot be reconciled with our bird; and does not mention the peculiarity of the large naked space below the eye, which could not have been passed over by so accurate an observer, especially when he had seen the bird alive.

I am therefore, somewhat unwillingly, compelled to give a new

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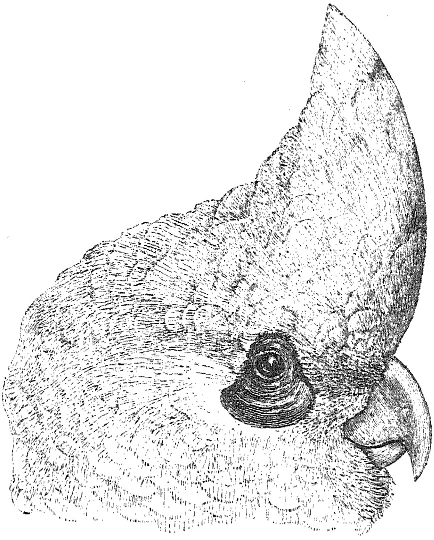
* See P. Z. S. 1868, App. p. 645.

Fig. 4.



Head of *Cacatua gymnopis*.

name to our last mentioned bird, and propose to call it, from the large naked space below the eye,

CACATUA GYMNOPIS, sp. nov.

Alba: fronte et loris rosaceis: regione ophthalmica nuda, infra dilatata, cærulescenti-plumbea: crista pyramidali: plumis capitis cervicis et ventris ad basin rosaceo tinctis: remigibus rectricibusque intus limonaceo-flavescentibus: crassitie eam C. sanguineæ *paulo superante.*

Hab. South Australia.

Viv. Soc. Zoolog. Londinensis.

[*Obs.* Since preparing these notes I have noticed that the two *Cacatuæ* in the gallery of the British Museum, obtained by Sturt at Depot Creek during his expedition into Southern Australia, and marked *Cacatua sanguinea*, evidently belong to the present species, (*cf.* Sturt's Narrative, vol. ii. Appendix, p. 36). The correct locality of the bird will therefore be the interior of South Australia.]

29. CONURUS ÆRUGINOSUS.

In his excellent monograph of the Parrots (i. p. 506) Dr. Finsch has united the *Psittacus æruginosus* of Linnæus (Syst. Nat. i. p. 142) along with a number of other synonyms (*Conurus xantholæmus*, mihi, *C. chrysogenys*, Souancé, and *C. ocularis*, Scl. et Salv.) into one species under *Conurus pertinax*. I am not now quite in a position to discuss the correctness of all these identifications; but as regards *Ps. æruginosus,* which was founded primarily upon Edwards's "Brown-throated Parrakeet" (Birds, iv. pl. 177), I think there can be no question that Dr. Finsch is in error in considering this, as he does (*l. c.* p. 507), the young of *C. pertinax.*

Since September 1866 we have had living in the Gardens two specimens of *Conurus æruginosus,* as I have always termed them, which were presented to the Society by Mrs. C. Vinall on the 21st of that month. These birds have still the bluish cap and brown throat characteristic of *C. æruginosus,* as portrayed in Edwards's figure, and have not acquired any yellow on the head or face. There are merely some slight indications of a few yellow feathers round the eye. I have two skins, exactly similar, in my own collection, one of a bird formerly living in the Society's Gardens, which died in December 1866, and the other collected at S. Esteban in Venezuela, by Mr. Goering*. Mr. Salvin has a precisely similar specimen, lately obtained by Mr. Wyatt at Cienaga, in the valley of the Magdalena.

Under these circumstances I think that *Conurus æruginosus* must be restored to its position in the genus, as Mr. Salvin and I have already attempted to show, P. Z. S. 1867, p. 588.

30. PSITTACUS TIMNEH, Fraser.

As Dr. Finsch, although admitting this species, has stated that he nevertheless believes it to be only the young of *Psitt. erithacus,* I think it right to state that the example of this species acquired by the Society in February 1861 is still living in the collection, and has not changed in the least; so that there can be no question, I think, of its being quite a distinct species.

Mr. Bartlett tells me he has seen numbers of the Timneh Parrot in the hands of dealers, and that it is perfectly well known as a distinct species.

31. TANYGNATHUS ALBIROSTRIS, Wallace.

In March 1868 we purchased the first living specimen I had ever seen of this species, as already recorded in the Society's 'Proceedings' (1868, p. 262). In August 1869 we purchased a second; and a third individual of the same form is now living in the Society's Gardens.

I must say that, so far as I can tell from an examination of the living birds, I am inclined to agree with Mr. Wallace (P. Z. S. 1862, p. 336) in considering this bird specifically distinct from *T. muelleri,* of which we have had several living examples. It is at once recognizable by its white bill.

32. BUTEO AUGURALIS, Salv.

Two Buzzards, purchased April 26, 1866, and believed to have been received from West Africa, were named by me *Buteo augur*†, and thus inserted in the Society's register. Mr. Gurney, however, to whom we owe many thanks for the trouble he takes in the correct determination of the raptorial birds in the Society's collection, after a careful examination decided that they were referable to the allied species described by Dr. Salvadori in 1865 as *Buteo auguralis* (Atti Soc. It. viii. p. 376); and I have altered the name in the new List of Animals accordingly.

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* See P. Z. S. 1868, p. 632.

† See P. Z. S. 1866, App. p. 609.

33. SPILORNIS BACHA, Daud.

In May 1865, Mr. A. Grote sent home to us from Calcutta two young specimens of a bird-of-prey of the genus *Spilornis*, received by him from the Andaman Islands, and considered to be typical of "*Hæmatornis elgini*, Tytler," as described by Blyth, J. A. S. B. xxxii. p. 87 (1863), and 'Ibis,' 1863, p. 118.

These birds lived long in the Gardens, and were constantly examined by Mr. J. H, Gurney, who eventually purchased one of the dead specimens for the Norwich collection. Mr. Gurney pronounced them to be without doubt identical with *Spilornis bacha* (Daud.) of the Malay countries. I think it right to call attention to this, as in his list of Andaman birds, published in 'The Ibis' for 1867, Mr. Beavan has stated that the specimen received by us from Mr. Grote was referable to *Spilornis cheela* of India—an error subsequently corrected by Mr. Blyth (Ibis, 1868, p. 131).

It would appear therefore that both *S. cheela* and *S. bacha* occur in the Andaman Islands.

34. CROSSOPTILON MANTCHURICUM, Swinhoe.

In the last edition of the List of Vertebrates (p. 141) and hitherto generally I have called this bird *Crossoptilon auritum* (Pall.). But from what Mr. Swinhoe informs me there seemed to be little doubt that the newly described *Crossoptilon cærulescens* of Père David (C. R. lxx. p. 538) will turn out to be the true *Phasianus auritus* of Pallas; and we must therefore adopt for the present bird Mr. Swinhoe's alternative name *mantchuricum*, proposed P. Z. S. 1862, p. 286. The genus *Crossoptilon* will therefore now comprehend four species:—

1. *C. tibetanum*, Hodgson, from Eastern Tibet.
2. *C. drouyni*, Milne-Edwards, C. R. April 20, 1868, from Western Szechuen.
3. *C. auritum*, Pallas, from the Gobi Desert.
4. *C. mantchuricum*, Swinhoe, from China, north of Pekin.

As regards our living specimens of the latter bird, I regret to say that our hopes of introducing this fine bird permanently into Europe appear likely to be miserably disappointed. Nearly all those in our Gardens, both introduced and bred, alike have sickened and died, and at the present moment we are left with two females only. In most of the Continental gardens, so far as I can make out, nearly the same event has taken place.

35. NUMIDA EDOUARDI, Hartl.

Last year, as recorded in these 'Proceedings' (1870, p. 383), we purchased of the Société Zoologique d'Acclimatation a pair of

Crested Guineafowls, which were the types of Mr. Elliot's new species *Numida verreauxi* (Ibis, 1870, p. 300, and Monogr. of Phas. pt. i. pl. 16). I am, however, informed by M. Jules Verreaux that they are of the same species as that previously dedicated by Dr. Hartlaub to the late M. Edouard Verreaux as *Numida edouardi* (Journ. f. Orn. 1867, p. 36). The latter name has naturally precedence.

36. LARUS ATRICILLA, Linn.

In April last year we purchased of a dealer two Gulls in immature and dirty plumage, stated to have been received from "New Zealand." Relying, somewhat too confidently I confess, on this locality, I entered them in the Register of Additions as *Larus melanorhynchus*, Buller*, that being the only species in the list of New Zealand birds likely to suit them. One of them died, but the other moulted into fine plumage this spring, and has put on a beautiful black hood, dark mantle, and other characteristics of the well-known North-American species *Larus atricilla*.

I am not aware that we have previously had a living specimen of this bird in the Society's collection.

37. APTERYX AUSTRALIS, Shaw.

The *Apteryges* living in our gardens have hitherto been referred to *A. mantelli*, Bartlett. Having, however, lately had an opportunity of examining a series of specimens, I find that there is a large amount of individual variation among them, particularly as regards the scaling of the tarsus, and have nearly come to the conclusion that there are only two species of the genus yet properly discriminated, namely *Apteryx australis* (embracing all that we have hitherto called *A. mantelli*) and *A. oweni*. Of the distinctness of these two species (both of which are now represented in our living collection) there can, I think, be no possible doubt.

3. On the Birds of the Vicinity of Lima, Peru. By P. L. SCLATER, M.A., Ph.D., F.R.S. With Notes on their Habits; by Professor W. NATION, of Lima, C.M.Z.S. (Part IV.†).

[Received April 26, 1871.]

Various circumstances have unfortunately hindered our corresponding member Professor Nation for some time past from continuing to transmit to me his collections and notes. He has, however, lately found an opportunity of sending me a few skins, accompanied by the following remarks:—

1. PHRYGILUS ALAUDINUS (Kittlitz); Sclater, Cat. A. B. p. 111.

"In 1867 I discovered this beautiful bird on a large plain, covered with low bushes, a few miles from Lima. It was feeding on the ground, after the manner of a *Zonotrichia*. Subsequently, I have made hundreds of visits to this plain, and have shown the example to many sportsmen, but have neither seen it again myself nor been able to obtain any information respecting it. I am therefore of opinion that its occurrence in this plain was accidental, and hope to discover its true abode in some of the valleys of the Andes."—W. N.

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* See P. Z. S. 1870, App. p. 895.

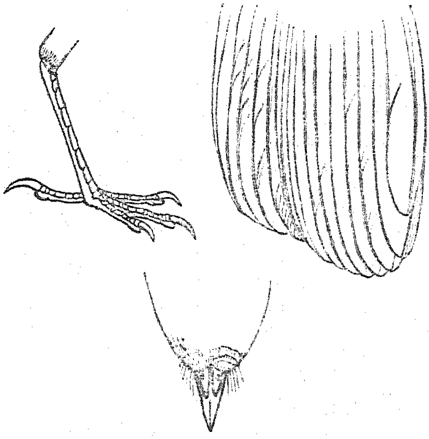
† Continued from P. Z. S. 1869, p. 148.

Mr. Nation calls this bird "*erythrorhynchus*, Lesson," referring it to the *Fringilla erythrorhyncha* of Lesson (Journ. de l'Inst. 1834, p. 316; et Zool. Thétis, ii. p. 324). This is doubtless correct; but the name of Kittlitz, usually employed, is older (1832).

This bird ranges from Chili as far north as Ecuador, where Fraser met with it on the plateau of Riobamba.

2. SPERMOPHILA TELASCO, Lesson; Sclater, Ibis, 1871, p. 7.

"This is a very familiar and social little bird, frequenting our gardens, orchards, and road-sides, and associating with *Volatinia* and *Zonotrichia*. The nest is usually in a low bush near the road-side or garden-walk. The eggs are three in number, of a pale greenish blue, irregularly marked with brown. This bird feeds on seeds and insects. Its irides are bluish black. The plumage of the sexes has no perceptible difference."—W. N.



Euscarthmus fulviceps.

3. EUSCARTHMUS FULVICEPS, sp. nov.

Fuscus: pileo toto et capitis lateribus fulvescenti-rufis: alarum marginibus externis pallidioribus fere ochraceis: subtus albus, pectoris lateribus cinereo perfusis: subalaribus limonaceo-flavis: remigum marginibus internis rufescenti-ochraceis: rostro superiore fusco, inferiore albicante: pedibus obscure car-

neis : long. tota 3·8, *alæ* 2·75, *caudæ* 1·4 *: cauda vix rotundata, alis brevibus, remigibus tertio quarto quinto et sexto fere æqualibus.*

Hab. Vicinity of Lima (*Nation*); Babahoyo, Western Ecuador (*Fraser*).

Amongst the birds collected by Mr. Fraser in Ecuador was a specimen of a small *Todirostrum*-like species, shot at Babahoyo in August 1859, which from its bad condition I was unable to determine, and entered in my list of his collection (P. Z. S. 1860, p. 283) as *Todirostrum*, sp.? In my American Catalogue (p. 209) I associated this specimen with another imperfect skin of a bird of the same group previously obtained by Fraser at Nanegal (P. Z. S. 1860, p. 93), but, I now believe, erroneously; for I subsequently convinced myself that the Nanegal skin was merely *Euscarthmus squamicristatus* (Lafr.) in young plumage. But Mr. Fraser's Babahoyo skin is certainly the same as that of which Professor Nation now sends an excellent skin from Lima.

E. fulviceps seems to be distinguishable from all other members of the genus that I am acquainted with by its fulvous head. Mr. Nation sends me the subjoined note on it.

"In 1869 I discovered this interesting little Tyrant in an Acacia-grove, situated between a marsh and the sea-shore, about ten miles from Lima. Subsequently I have visited this place many times, and have always found a few of these birds in company with individuals of *Eupsilostoma* in the extremities of the branches; but, as far as I know, it is not met with elsewhere in this district. Its habits so much resemble those of the *Eupsilostoma* that for many years I confounded the two species together.

"The food of this bird consists of sedentary insects. Its irides are brownish black."—W. N.

4. ANÆRETES ALBOCRISTATUS (Vig.); Sclater, Cat. Am. B. p. 212.

"This beautiful little tyrant is only an accidental visitor in the vicinity of Lima. One Sunday afternoon, in December 1868, I saw three individuals of this species in an Acacia tree overhanging a river. On the following morning I succeeded in finding them in the same tree and in shooting one; in the course of the week following I managed to obtain the other two. The birds proved to be an adult female and her two young ones. They were very restless, and continually moving from one twig to another. The food of this species appears to be exclusively insects. The irides are brownish blue.

"On the 8th of February, 1871, I again found this species, sixty miles up the siver, at an altitude of 3000 feet."—W. N.

5. AMAZILIA PRISTINA, Gould.

"As I write an *Amazilia pristina* has been sitting perched on a plant in the garden outside my window, singing delightfully at intervals. *Rhodopis vesper*, *Thaumastura cora*, and *Th. francescæ* seem to be silent species."—W. N.

4. On two new or little-known Parrots living in the Society's Gardens. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received May 16, 1871.]

(Plates XL. & XLI.)

The Society's collection has been recently augmented by the receipt of a certain number of animals, obtained by Mr. William Jamrach in the markets of Calcutta, several of which are of much interest. Of these I shall speak more fully in my next report on the additions to the Society's Menagerie. But I wish to lose no time in calling attention to the fine additions to the Society's series of living Psittacidæ, belonging to the species of the genera *Lorius* and *Trichoglossus*. The first of these, which appears to be undescribed, I propose to characterize as follows:—

Lorius tibialis, sp. nov. (Plate XL.)

Coccineus: alis extus viridibus: campterio alari et subalaribus cyaneis: remigibus subtus flavissimis: semitorque pectorali obsoleta, flava: cauda coccinea, dimidio apicali nigricante: tibiis cyaneis: rostro clare aurantiaco, pedibus pallide carneis: unguibus corneis.

Obs. Species forma et crassitie *Lorii garruli*, a quo differt plaga interscapulii nulla, semitorque pectorali flava et tibiis cyaneis.

Only a single example of this fine new Lory was brought home by Mr. Jamrach. It was doubtless originally procured from one of the less explored islands of the Molucca group, which is rarely visited by traders. A slight irregular spotting on the wing is probably due to individual variation.

Along with this Lory we obtained a specimen of a small species of *Trichoglossus*, which I at first supposed to be also new. I am now, however, inclined to believe it to be referable to *Trichoglossus mitchelli*, G. R. Gray (Finsch, Papag. ii. p. 858). The only previously known specimen of this species, now in the British Museum, was likewise formerly living in the Society's Gardens.

Mr. G. R. Gray has kindly sent me the following notes, made on comparison of the drawing of this bird (Plate XLI.) with the typical specimen of *T. mitchelli* in the British Museum:—

"Your drawing of *T. mitchelli* is not quite like the British-Museum specimen, as the following particulars of our example will, I think, show you, viz.:—Head, cheeks, and throat have a tendency to blue in some lights; frontlet with a narrow azure-blue band; cervical band is more yellow; the dark blue-black is on the green below the broad crimson band on breast; the latter has some indications of very narrow bands of yellow or of green; the yellow on the sides above the thighs and under tail-coverts is less prominent; the thighs are bright yellow; the under surface of tail-feathers a dull yellow; the outer web of first quill pure black."

5. On *Machærhamphus anderssoni*.

By R. B. Sharpe, F.L.S., Librarian to the Society.

[Received April 11, 1871.]

By Lord Walden's kind permission I am enabled to exhibit tonight one of the very rarest of *Accipitres*, the *Machærhamphus alcinus*, from Malacca; and I take the present opportunity of giving a history of the two species of *Machærhamphus* now known, as great confusion exists as to the question of their specific identity.

In the 1st volume (1848) of the 'Bijdragen tot de Dierkunde,' which forms the 4to publication of the Zoological Society of Amsterdam (Natura Artis Magistra), Dr. G. F. Westerman described a bird from Malacca which he called *Machærhamphus alcinus*, making it the type of a new genus and species. The typical specimen, which was placed, and is still to be seen in the Museum at Leyden, remained unique for many years, till in 1865 the late Mr. Andersson sent to Mr. Gurney a bird which the latter gentleman believed to be new to science, and to which he therefore gave the name of *Stringonyx anderssoni*, after its discoverer. This was described at a Meeting of this Society on the 14th of November, 1865; but on the 12th of June in the following year Mr. Bartlett made some remarks on the specimen, which he believed to be the previously described *M. alcinus* of Dr. Westerman, supposing the latter gentleman to have made an error in the locality whence his example came. The way that Mr. Bartlett accounted for the mistake was in this wise. In 1852 he received a collection for sale from the late Mr. Andersson, which was the first consignment of that excellent collector to this country. This collection, or rather the remnant of it, was described in the 'Contributions to Ornithology,' by Messrs. Strickland and Sclater (*l. c.* 1852, p. 141). After stating that the birds had been sent to "Mr. A. D. Bartlett, of London, for sale," Mr. Strickland proceeds:—"Unfortunately, as too often happens in such cases, many of these birds were dispersed before any catalogue was made of them. Some were purchased for the British Museum; others were bought by Mr. Frank, a dealer in Amsterdam; and of the residue about 100 specimens have passed into my possession." It so happened that Mr. Gurney asked Mr. Bartlett, who is, as we know, one of the best taxidermists in the world, as a favour, to stuff the Damara specimen of *Stringonyx* for the Norwich Museum, to which Mr. Gurney had presented it; and no sooner had Mr. Bartlett seen the specimen, than he called to mind a similar bird which he had once before possessed. This was of course the identical type of *Machærhamphus*; and

Mr. Bartlett, remembering that at the time the Damara birds were bought a great number of Malaccan specimens were also purchased, concluded that the collections had been mixed, and that thus the Damara bird had come to be credited with a Malaccan habitat. Acquiescing in Mr. Bartlett's identification, Mr. Gurney sunk his proposed name of *Stringonyx anderssoni*, and his specimen was figured in the 'Transactions' as *Machærhamphus alcinus*. Thus the matter remained till the year 1868, when in Mr. Andersson's last collection another specimen was sent home, and passed into the National collection, where it now remains. Mr. Gurney requested me to send him my opinion upon the specific identity of this last specimen with the figure of *M. alcinus* (*l. c.*). I therefore took up the subject, and I found that the bird sent by Mr. Andersson was identical with the one previously transmitted by him and figured in the 'Transactions' (*l. c.*); but the absence of a crest in both these birds, added to a white eye-ring and abdomen, which did not appear in the Malaccan bird, induced me to suggest to Mr. Gurney the possibility of their being distinct species, while, from an examination of the figures of the tarsi given in the respective works above quoted, I inclined to believe in their belonging really to two distinct *genera*. Mr. Gurney shortly after visited Leyden; and having critically examined the Damara bird in the British Museum before starting, he told me on his return that he fully believed in its specific and generic identity with the type of *M. alcinus* at Leyden. Acquiescing at once in the opinion of so distinguished an authority on *Accipitres* as Mr. Gurney, I allowed the subject to drop for a time, till all my doubts were again revived by my friend M. Jules Verreaux, to whom I referred the controversy during his recent sojourn in England, when he informed me that I was quite right in insisting on the specific distinctness of the two species, for that he had lately seen both old and young birds of the true *M. alcinus* from *Malacca* in Count Turati's collection. This information urged me once more upon the scent; but I was unable to discover any new facts bearing upon the subject, till in a recent collection formed by the late Dr. Maingay at Malacca, which has passed entire into Lord Walden's hands, I was delighted to perceive at last a specimen of *M. alcinus*. Thus the question was solved as far as regards the correctness of the habitat; and on comparing the specimen lately received with the Damara bird in the British Museum, I am able to state the following facts. Although the legs are damaged in the Damara bird, there is, so far as we can see, no real difference in the scaling of the tarsi, as would appear from the figures given in the works before mentioned; so that Mr. George Robert Gray and I quite agree that, beyond the occipital crest in the Malaccan bird (which it is not yet proved that the Damara species, when adult, does not assume), the two species cannot be generically separated; and I am glad to have had this veteran ornithologist at my elbow, as it is a bold thing to assert the absolute similarity between two genera belonging to such widely distant localities. As regards specific characters we both agree that the birds are quite distinct.

The Malaccan species coincides with the Damara bird in the form and style of plumage, having the white ring round the eye and the stripe down the throat, but differs in its larger bill, darker colours, brown abdomen, and long occipital crest. There seems, however, to be a difference in the white feathers round the eye. *M. anderssoni* has a white superciliary line and a white spot below the eye; *M. alcinus* has the latter plainly mottled, but has no distinct supercilium, though the feathers round the rim of the eye are whitish. Thus it will be seen that the Damara species must be restored under the name of *Machærhamphus anderssoni*, though the genus *Stringonyx* is not distinct from *Machærhamphus*, and thus sinks into a synonym. On the importance of the discovery of a generic form peculiar to South-western Africa and Malacca I need scarcely dwell, as this fact will be recognized by all my hearers.

The following is a brief synopsis of the genus as it now stands:—

Genus MACHÆRHAMPHUS.

	Type.
Machærhamphus, Westerm. Bijd. tot d. Dierk. i. p. 29, pl. 12 (1848)	*M. alcinus*.
Stringonyx, Gurney, P. Z. S. 1865, p. 618	*M. anderssoni*.

Clavis specierum.

a. crista occipitali magna: abdomine brunneo...........	1. *alcinus*.
b. crista occipitali nulla: abdomine albo	2. *anderssoni*.

1. MACHÆRHAMPHUS ALCINUS.

Machærhamphus alcinus, Westerm. Bijd. tot de Dierk. i. p. 29, pl. 12 (1848); Schl. Handl. tot de Beoef. der Dierk. i. p. 168, pl. 1. fig. 6 (1857); *id*. Cat. Mus. Pays-Bas, *Pernes*, p. 7 (1862).

M. *paulo major: nigricanti-brunneus: rostro robustiore: crista occipitali longissima nigricante: regione orbitali albida: macula suborbitali conspicua alba: pectore albo, mento et striga gulari brunneis, plumis gutturalibus nonnullis etiam brunneo variis: pectore imo et abdomine toto nigricanti-brunneo.*

Hab. Malacca (*Maingay*).

2. MACHÆRHAMPHUS ANDERSSONI.

Stringonyx anderssoni, Gurney, P. Z. S. 1865, p. 618.

Machærhamphus alcinus (err.), Bartlett, P. Z. S. 1866, p. 324; Gurney, Trans. Zool. Soc. vi. pl. 29 (1869); Gray, Hand-l. of B. i. p. 26 (1869).

M. *umbrino-brunnea: crista occipitali nulla: supercilio et striga suborbitali albis: abdomine albo, pectore medio brunneo.*

Hab. Damara Land (*Andersson*).

6. Descriptions of six new Humming-birds.

By John Gould, F.R.S.

[Received May 16, 1871.]

The first is a species of the genus *Helianthea*, lately sent to this country by Mr. Henry Whitely, who is at this moment pursuing his zoological researches in Peru; the remaining five have been in my collection for some time. It will be remembered that Mr. Whitely was also the discoverer of that highly curious and interesting Humming-bird which I characterized in the 'Proceedings' of this Society for 1869, p. 295, as *Oreonympha nobilis*; and I would here bear testimony to the zeal and perseverance with which he is investigating the distant and almost untrodden parts of the country in which he is now located, and wherein there are doubtless many novelties yet to be discovered in every branch of zoological science.

HELIANTHEA OSCULANS, Gould.

Crown of the head, viewed anteriorly, black, with a spot of brilliant green on the forehead, as in *H. bonapartei*; back and upper tail-coverts bronzy green; shoulders golden brown; primaries purplish black, the exterior web of the first buff; throat and breast brilliant green, with a patch of an equally brilliant blue in the centre of the former; abdomen buff, tinged and mottled with green; thighs buffy white; under tail-coverts light buff; tail-feathers deep buff, tinged with green at the tip, especially the two centre ones; bill black.

Total length $5\frac{1}{2}$ inches; bill $1\frac{5}{8}$, wing $3\frac{1}{8}$, tail $2\frac{1}{8}$, tarsi $\frac{1}{4}$.

Hab. Ecachupata and Huasampilla in Peru; collected by Mr. Henry Whitely.

Remark. This new species is about the same size as *H. violifera*, but differs from that bird in having a stouter and longer bill, by the spot on the forehead being larger, and green instead of blue; by the tips of the tail-coverts and tail-feathers being tinged with olive-green, and by the breast being of a more brilliant green, and destitute of any crescentic greyish-white mark across the chest.

HELIANGELUS SQUAMIGULARIS, Gould.

Bill straight and black; crown of the head, viewed anteriorly, black, posteriorly golden green; on the forehead a faint indication of a glittering spot or bar; throat shining oil-green, bordered on each side with an obscure line of black when viewed anteriorly; abdomen green; under tail-coverts grey, with green centres; thighs greenish white; toes black; upper part of the back green, passing into the brighter green of the rump and upper tail-coverts; two central tail-feathers green, the remainder black; tail slightly forked; wings purplish brown.

Total length $3\frac{1}{4}$ inches; bill $\frac{13}{16}$, wing $2\frac{1}{2}$, tail $1\frac{1}{4}$.

Hab. Columbia.

Remark. I should have considered this curious bird a *lusus*, so anomalous is its colouring; but on further investigation I am induced to characterize it as distinct. Its nearest allies are *Heliatrypha parzudaki* and *Heliangelus clarissæ*; but it differs from both in having a more lengthened bill, in the different colouring of its under tail-coverts, and in the unusual hue of its throat.

HELIOMASTER ALBICRISSA, Gould.

Throat fiery reddish purple; crown light glistening green; upper surface and two central tail-feathers bronzy green, with the usual white mark in the centre of the back; four outer feathers on each side bronzy green, becoming nearly black towards the end, and tipped with white, the external one more largely than the others; wings purplish brown; chest grey; flanks bronzy grey; centre of the abdomen white; bill black.

Total length $4\frac{1}{2}$ inches; bill $1\frac{5}{8}$, wing $1\frac{3}{8}$, tail $1\frac{1}{2}$, tarsi $\frac{1}{4}$.

Hab. Citado in Ecuador.

Remark. Nothwithstanding the uncertainty as to whether *Heliomaster longirotris*, *H. stuartæ*, *H. sclateri*, and *H. pallidiceps* are all one or so many distinct species, I feel that I have no alternative but to add to the confusion, if confusion there is, by giving the above description of a bird of the same form lately sent by Mr. Buckley from Citado in Eucador. Its size is about the same as that of *H. longirostris* and its near allies; but it differs from them all in having a still larger and longer bill and a much redder throat-mark, in the white spot on the external tail-feather being longer or larger, in the lower part of the abdomen being white; in the under tail-coverts being greyish white, instead of blackish green, with lighter edges, and in the glittering feathers of the crown being of as pale, or nearly as pale a green as in the *H. pallidiceps* of Mexico. As the peculiar markings of the tail and the under tail-coverts do not occur in *H. longirostris* of Trinidad and some parts of Venezuela, nor in the *H. sclateri* of Costa Rica, I am induced to regard the present bird as new.

LESBIA CHLORURA, Gould.

Crown of the head and all the upper surface golden green; gorget glittering green, round and well-defined as in *L. gouldi*; abdomen mottled green and buff, its lower portion and the under tail-coverts pure buff; wings purplish brown; the eight central tail-feathers entirely light green, the external one on each side olive, finely powdered and tipped with green, and having the outer web buff for more than half its length from the base.

Total length $6\frac{1}{2}$ inches; bill $\frac{9}{16}$, wing 2, tail $5\frac{3}{8}$.

This species has all the characteristics of elegance; indeed a more graceful little creature can scarcely be conceived. It is very nearly allied to *Lesbia gouldi* and *L. gracilis*, but differs from both in having a more lengthened, straighter, and greener tail, and is more especially distinguished by having a much longer and stouter bill than either of them. Its native country is supposed to be Peru. The specimen described has been in my possession for a length of time, but I have delayed characterizing it in the hope that other examples might be received.

ERIOCNEMIS RUSSATA, Gould.

General plumage of a russet-brown; wings purplish brown; tail black; boots, or feathery covering of the thighs, rather scant for an *Eriocnemis*, white in front, and of a light cinnamon or deep buff posteriorly.

Total length $3\frac{3}{4}$ inches; bill 1, wing $2\frac{3}{8}$, tail $1\frac{1}{2}$.

Hab. Ecuador. Supposed to have been obtained on the banks of the Napo; but this is by no means certain; my specimens were received from Quito.

Remark. Those Trochilidists who are acquainted with the description of the little *Eriocnemis aureliæ* will at once perceive that the present bird is very nearly allied to, and may perhaps consider it to be identical with, that species; but when I assure them that I have carefully compared three or four examples of this bird, which is from Quito, with at least one hundred specimens of the Bogotan *E. aureliæ*, they will, I trust, do me the justice to believe that I have not characterized it as distinct without due consideration. The *E. russata* may at all times be distinguished by its larger size, by its russet colouring, and by its much more lengthened bill.

POLYTMUS LEUCORRHOUS, Gould.

Polytmus leucorrhous, Gould, MS.; Sclat. & Salv. in Proc. of Zool. Soc. 1867, pp. 584, 752.

Polytmus leucoproctus, G. R. Gray, Hand-list of Birds, part i. p. 128. no. 1626.

Male. The entire upper and under surface pale flowery green, with the exception of the head, which is brown, and the crissum, which is white; wing-coverts golden green; wing purplish brown; tail bright green; bill light fleshy brown.

Total length $3\frac{5}{8}$ inches; bill $\frac{3}{4}$, wing $2\frac{1}{4}$, tail $1\frac{1}{2}$, tarsi $\frac{3}{16}$.

Female. Much smaller than the male, but similarly coloured, except that the three outer tail-feathers on each side are tipped with white, like those of the female of *Polytmus viridissimus*.

For our knowledge of the existence of this species we are indebted to the researches of A. R. Wallace, Esq., and Mr. Edward Bartlett, the former having obtained examples at Cobati, on the Rio Negro, and the latter on the river Huallaga, in Eastern Peru. It is most nearly allied to the *Polytmus viridissimus* of my Monograph of the Trochilidæ (see vol. i. Introduction, p. lxxxv, and vol. iv. pl. 231, and 8vo edit. of Intro. p. 127), but differs from that well-known bird in its under tail-coverts being pure white.

The specific appellation I have assigned to it first appeared in Messrs. Salvin and Sclater's "List of the Birds collected by Mr. Wallace on the Lower Amazons and Rio Nigro," and subsequently in the same gentlemen's "Catalogue of Birds collected by Mr. E. Bartlett on the River Huallaga, Eastern Peru," above referred to.

June 6, 1871.

George Busk, Esq., V.P., in the Chair.

Prof. Owen, F.R.S., read the seventeenth of his series of Memoirs on *Dinornis*, containing a description of the sternum and pelvis, with an attempted restoration of the whole skeleton of *Aptornis defossor*.

This paper will be published in the Society's 'Transactions.'

Prof. Flower, F.R.S., read a paper on the so-called Risso's Dolphin (*Delphinus rissoanus*), based on an examination of two specimens of this supposed species that had recently occurred on the English coast*. Prof. Flower, after a thorough investigation of this subject, came to the conclusion that the so-called *Delphinus rissoanus* was specifically identical with the *Delphinus griseus* of Cuvier, and that the species ought to stand as *Grampus griseus*.

This paper will be published in the Society's 'Transactions.'

The following papers were read:—

1. On the Occurrence of the Ringed or Marbled Seal (*Phoca hispida*) on the coast of Norfolk, with Remarks on the Synonymy of the Species. By W. H. Flower, F.R.S., V.P.Z.S., &c.

[Received June 5, 1871.]

While engaged in preparing a catalogue of the animals of Norfolk for the Norfolk and Norwich Naturalists' Society, Mr. Southwell met with the skull of a Seal in the Norwich Museum, which, with the permission of the authorities of the Museum, he submitted to my examination for the purpose of identification and, if need be, description, sending me the following history of the specimen:—

"Mr. J. H. Gurney bought the Seal in the Norwich Fish-market, and had the skull and skin preserved. When purchased it was in the flesh, quite fresh and in perfect condition; the fur was of a grey colour. The person of whom he bought it told him it came from some neighbouring part of the coast; but the exact locality he does not now remember. The date of its occurrence was some time previous to June 1846, probably in the spring of that year. It was also examined in the flesh by the late Mr. Thomas Brightwell, of Norwich; but I cannot find any record of the occurrence. The skull was presented to the Norwich Museum on Sept. 14, 1846, as the cranium of the 'Marbled Seal.'"

I am not able to learn whether the skin is at present in existence.

As this skull belongs to a species which is not generally admitted into the actual British fauna, it appears desirable that its characters should be described in sufficient detail to leave no doubt as to the correctness of the specific determination.

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* *Cf.* P. Z. S. 1870, p. 128.

Zoologists are now generally agreed that four well-defined species of Seal of the restricted genus *Phoca*[*] (an extremely natural group, characterized by having *i.* $\frac{3}{2}$, *c.* $\frac{1}{1}$, *p.* $\frac{4}{4}$, *m.* $\frac{1}{1}$, total 34, all the teeth of the premolar and molar series, except the most anterior, with two roots) inhabit the shores north of the Atlantic. These are *P. barbata*, *P. grœnlandica*, *P. vitulina*, and a fourth, about the specific name of which there is unfortunately no general agreement. To account for and to endeavour to clear up the difficulty of the synonymy of this species (to which the skull in the Norwich Museum belongs) it will be necessary to refer to the principal facts concerning the literary history of the genus.

The natives of Greenland appear to have long ago distinguished these four species, and to have bestowed distinctive vernacular names upon them, which are given in Crantz's well-known history of that country, published in 1765, though the descriptions which accompany them have, as might be expected, no scientific accuracy.

In the 12th edit. of the 'Systema Naturæ' (1767) all the true Seals (as above restricted) are confounded under the name of *Phoca vitulina*; but in Gmelin's edition (1788) *P. vitulina*, *P. grœnlandica*, *P. barbata*, and *P. hispida* are distinguished, besides others which are now considered to belong to different genera, and therefore do not concern us in the present inquiry.

Between these dates O. F. Müller's 'Prodromus Zoologiæ Danicæ' (Copenhagen, 1776) had been published, and contained in the introduction (p. viii) a list of Greenland animals communicated to the author by O. Fabricius, after the rest of the work had been printed. In this list *P. barbata*, *P. grœnlandica*, and *P. fœtida* are named, in addition to *P. vitulina*, the only true *Phoca* mentioned in the body of the work, and which was evidently, as in the 'Systema Naturæ,' a compound of several species, as shown by the various vernacular names assigned as synonyms. No description is given of these new species; but the Greenland names are added, *P. fœtida* being the *Neitsek* and *Neitsilek*.

In 1780 Fabricius published his 'Fauna Grœnlandica,' containing tolerably full accounts of all the above-mentioned four species of Greenland Seals; and, although descriptions of the external peculiarities of such very variable animals as Seals, unless extremely detailed and accompanied by osteological characters, are very difficult to recognize, there can be little doubt that the four species now known to exist are intended, and that Fabricius's *P. fœtida* is the animal now under consideration. The statement "*est hæc minima omnium*" is alone almost sufficient to establish this point. *Neitsek*, Crantz, is given among the synonyms of the species.

In the mean time, however, the third part of Schreber's 'Säugethiere' had appeared (1778 is the date on the titlepage of the volume; but the part must have been published previously, as it is quoted by Erxleben), in which a brief description (p. 312) is given of "der rauhe Seehund," which is latinized in the figure (pl. 86) into *Phoca hispida*, although this name is not given in the text. This is evidently founded upon the "Rough Seal" of Pennant (Synopsis of Quadrupeds, p. 341, 1771), the description of which is a mere reproduction of Crantz's account of the *Neitsek*. There is nothing either in Schreber's description or figure to identify the species; and it has since been thought (as by A. Wagner in his edition of this part of Schreber's work, 1846) to refer to a totally distinct animal, viz. *Halichœrus grypus*.

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[*] Nilsson, Skand. Fauna, 1820; equivalent to F. Cuvier's *Callocephalus*, Mém. du Mus. xi. 1824.

Erxleben, in his 'Systema Regni Animalis: Classis I. Mammalia' (1777), describes *Phoca vitulina*, *P. grœnlandica*, *P. barbata*, and *P. hispida*. The brief description of the latter is taken from Schreber (which, as mentioned above, is mainly derived from Crantz), who is given as the authority for the name; but *P. fœtida* (Müller, Prodr. Zool. Dan.) is given as a synonym.

This brings us back to Gmelin in 1788, who adopts the species and nomenclature of Erxleben.

In 1790 Fabricius published an elaborate paper on the Greenland Seals[*], in which he redescribes his *P. fœtida*, but withdraws the name he had bestowed upon it in favour of *P. hispida*, as he believes that it is the same species as that described by Schreber, Erxleben, and Gmelin under that name, which, he says, has therefore the priority over his own. In this paper figures are given of the skulls of *P. grœnlandica* and *P. barbata*, *Halichœrus grypus* and *Cystophora cristata*, but unfortunately none of *P. hispida*; or its specific identity would have been absolutely determined.

Although the name of *P. fœtida* was thus definitely withdrawn by its author, it has been revived and adopted by many recent zoologists, as the table of synonyms (p. 509) will show.

Nilsson, in 1820, not being able to satisfy himself that the species had been clearly determined by either of these names, when giving the first thoroughly accurate and detailed account of its characters, renamed it *P. annellata*[†]. This name has also been adopted by many modern authors.

In the 'Mémoires du Muséum' (tome xi. 1824) Fr. Cuvier (being apparently unacquainted with Nilsson's work) gave figures of the skulls of all four species of *Phoca*, three views of each, on one page (tab. 12), and therefore well adapted for comparison. Although they are taken from rather immature specimens, and not all of corresponding ages, they give the most characteristic differences clearly, and there is no difficulty in recognizing the species now under consideration in that to which the name of *hispida* is applied, apparently the designation under which it was received from Reinhardt (see fig. 3, *g*, *h* and *i*). In the same memoir the name of *P. discolor* is proposed for a Seal which had lived in the Jardin des Plantes, and which is figured and of which the external characters are described in the 'Histoire Naturelle des Mammifères,' tome i. ix. (1819), as the "*Phoque commun.*" This latter has since been recognized as belonging to the same species as Nilsson's *P. annellata*, and as the skull figured by Cuvier as *P. hispida*. In a later fasciculus of the 'Hist. Nat. des Mammifères,' it is spoken of as the "*Phoque marbré*;" and the figure has been copied in Hamilton's "Amphibious Carnivora" in the 'Naturalist's Library' as that of the "Marbled Seal."

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[*] In 'Skrivter af Naturhistorie Selskabet,' Copenhagen, 1st vol.

[†] Skand. Fauna, i. p. 362, 1820; see also "Entwurf einer systematischen Eintheilung und speciellen Beschreibung der Phoken, von Nilsson, aus dem Schwedischen übersetzt von W. Peters," Wiegmann's Archiv, viii. 1st vol. p. 301 (1841).

The principal synonymy of the species will therefore be as follows:—

Neitsek, Crantz, Hist. von Grönland, i. p. 164 (1765).

The Rough Seal?, Pennant, Synopsis of Quadrupeds, p. 341 (1771).

Phoca fœtida (not described), Fabricius, in Müller's 'Prodromus Zoologiæ Danicæ,' p. viii (1776).

P. hispida?, Schreber, Säugethiere, pt. iii. tab. lxxvii. (before 1778).

P. hispida?, Erxleben, Systema Regni Animalis, p. 589 (1777).

P. hispida?, Gmelin, Systema Naturæ (1778).

P. fœtida, Fabricius, Fauna Grœnlandica, p. 13 (1780).

P. hispida (*Fiordsælen*), Fabricius, Skriv. af Natur. Selskabet, Copenhagen, vol. i. pt. 2. p. 74 (1790).

P. fœtida, Desmarest, Mammalogie, Ency. Méthod. (1820).

P. annellata (*Ringlad Skäl*), Nilsson, Skand. Fauna (1820).

Callocephalus hispidus, F. Cuvier, Mém. du Muséum, xi. (1824) (skull).

C. discolor, F. Cuvier, *ibid.* (external characters).

P. annellata, Thienemann, Reise in Norden Europa's, pt. i. Nat. Bemerk. p. 83, tab. 9–12 (1824).

P. fœtida, Fischer, Synopsis Mammalium, p. 377 (1829).

P. annellata, A. Wagner, Schreber's Säugethiere, pt. viii. (1846).

Callocephalus fœtidus, Gray, Cat. Seals Brit. Mus. 1850, p. 23.

P. fœtida, Blasius, Säugethiere Deutschlands (1857).

P. annellata, Giebel, Die Säugethiere, p. 137 (1859).

P. hispida, Gaimard, Voy. Island. Mammalia, pl. 10. f. 1 & 2.

P. annellata, Radde*, Reisen im Süden von Ost-Sibirien, i. p. 296, tab. 1–3 (1862).

Pagomys fœtidus, Gray, Proc. Zool. Soc. (1864), p. 31; Cat. Seals and Whales in Brit. Mus. (1866) p. 23.

Although it may still be a matter of opinion which of these names ought to be adopted, it appears to me that, on the whole, preference should be given to *hispida*, on account of priority; for although the earliest descriptions under this name are very meagre and inaccurate, they are avowedly founded on the *Neitsek* of Crantz, the appellation by which this Seal is known to the Greenlanders to this day according to Mr. R. Brown †, and are therefore intended for this species, and especially because Fabricius in 1790 definitely adopted the name, withdrawing that of *fœtida*. I am further strengthened in this opinion by finding that those eminent Danish naturalists Steenstrup* and Reinhardt† both use *hispida* when speaking of this Seal.

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* This author gives a detailed description, with figures, of the Seal of Lake Baikal, which appears to be a variety of this species.

† "On the Seals of Greenland," P. Z. S. 1868, p. 414.

The name may perhaps be objected to as not strictly appropriate; but a similar objection might also be made to the others; and this is a dangerous ground for superseding the law of priority in a case where the name can be hardly said to "imply a false proposition which is likely to propagate important errors" ‡.

This Seal, which is the *Floe-rat* or *Flaar-rat* of the Northern English and Scottish Sealers, appears to be essentially a boreal species. Mr. R. Brown ("On the Seals of Greenland," P. Z. S. 1868, p. 415) says, "In the Spitzbergen sea they appear to be confined to high latitudes, and especially to the parallels of 76° and 77° N.; and it is in these latitudes that the whalers chiefly find them. In Davis's Strait it is to be found all the year round, but particularly up the ice-fjords. Its capture constitutes the most important feature of the Seal-hunt in North Greenland; but many are also killed in South Greenland, the Neitsik figuring largely in the trade-returns of that Inspectorate." Nilsson speaks of it as being found on all the Scandinavian coasts, and as having been met with as far south as the Channel, on the strength of specimens in the Paris Museum from that locality; but he was unable to find any proof of its having been met with on the coast of England.

Nor have I been able to discover any positive evidence that it can at the present day be reckoned a British species, although there is little doubt that it must occasionally visit our shores, where its occurrence would be easily overlooked.

As conjectured by Lloyd §, it may be identical with the *Bodack* or *Old Man* of the Hebrides, described by J. Wilson as the smallest and most rare of the indigenous Seals of those islands ‖—though, on the other hand, Edmonston does not include it in his account of the Seals found in the Shetland Islands, and appears even to doubt its existence ¶.

Recently Professor Turner has shown that the numerous remains of Seals found in the various beds of clay of the glacial period in the south-eastern portion of Scotland should be referred to *P. hispida* **.

I must now advert to the characters by which the skull in the Norwich Museum has been determined to belong to this species.

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* "Melketandsættet hos Remmesælen, Svartsiden og Fjordsælen (*Phoca barbata*, O. Fabr., *Ph. grönlandica*, O. Fabr., og *Ph. hispida*, Schr.)," Vid. Medd. f. d. Naturh. Forening, 1860. Kjöbh. 1861, s. 251–261.

† "Om Klapmydsens ufödte Unge og dens Melketandsæt," Naturh. Foren. Vidensk. Meddelelser, 1864.

‡ Report of Nomenclature Committee, British Association, 1842.

§ Game Birds and Wild Fowl of Sweden and Norway, 1867, p. 399.

‖ "Notes regarding the distinctive habits of the Scotch *Phocæ*," Mag. Zool. & Bot. vol. i. 1837, p. 539.

¶ "On the Distinctions, History, and Hunting of Seals in the Shetland Islands," Mem. Werner. Soc. Nat. Hist. vol. viii. pt. 1, 1839, pp. 1–48.

** Journal of Anatomy and Physiology, May 1870, p. 260.

It must first be mentioned that it is that of a very aged animal, as shown by the condition of the cranial sutures and the teeth. Of the latter some had been lost during life, and others after the preparation of the skull; and all those that remain are worn down nearly to the level of the alveolar border, so that they are of little use for identification. As far, however, as their characters serve, they agree with those of other specimens of *P. hispida* with which I have compared them, being rather smaller than those of *P. vitulina*, and having the long diameter of the molars in a line with the alveolar border, and not oblique, as is almost always the case with the latter.

The deep angular emargination of the hinder border of the bony palate at once distinguishes this skull from that of either *P. barbata* or *P. grœnlandica*; so that *P. vitulina* is the only one with which it could be confounded. It is distinguished from this species:—

1st. By its small size; for though Seals have a considerable range of variation in this respect, all the perfectly adult examples of *vitulina* I have met with are considerably larger than the present specimen, ranging from 7·7 inches (196 millim.) to 8·5 inches (216 millim.).

2nd. By the narrowness of the upper surface of the skull between the orbits, and also of the nasal bones. Different specimens of *P. vitulina* vary much in this respect, but they are always broader in this region than *P. hispida*.

3rd. By the presence of a rudimentary anteorbital process on the maxillary bone, which is always absent in *P. vitulina*.

4th. By the pointed form of the upper end of the ascending process of the præmaxilla, which is in contact for a considerable space with the nasal—whereas in *P. vitulina* this process is usually more or less truncated above, and is completely separated from or only just touches (at one point) the nasal. Both *P. barbata* and *P. grœnlandica* resemble *P. hispida* in this character.

5th. By the posterior palatine foramen being situated on or behind the maxillo-palatine suture. In *P. vitulina* it is placed in the maxillary bone altogether in front of the suture. This and the last are important diagnostic characters, being constant and readily recognized.

6th. By the wide interval on the upper surface of the cranium between the ridges which bound the temporal fossa, whereas in old specimens of *P. vitulina* these ridges meet at the vertex.

7th. By the larger size of the unossified spaces in the base of the skull lying to the inner side of the auditory bullæ.

8th. By the comparative shallowness (vertically) of the hinder portion of the ramus of the mandible, occasioned by the smaller development of the region of the angle, and especially of the anterior margin of the coronoid process, which is altogether weaker than in *P. vitulina*.

9th. By the form of the inferior margin of the ramus of the mandible, which in the present species (as in *P. barbata* and *grœnlandica*) has a conspicuous expansion inwards a short distance behind the symphysis, which causes the edges of the rami to continue more or less approximated for nearly half the length of the lower border;

whereas in *P. vitulina*, which has not this expansion, they diverge rapidly immediately behind the symphysis. I must, however, remark that some examples of the latter species present in this region a considerable approximation to the form met with in the other members of the genus.

The principal dimensions of the skull are as follow:—

	millims.
Length of cranium, from anterior extremity of præmaxilla to occipital condyle	183
Greatest breadth across zygomata	120
Breadth of skull in temporal fossæ, just above the posterior roots of the zygomata	90
Breadth of frontals between orbits	8
Breadth of both nasals at middle of their length	9
Length of nasal	44
Breadth of occipital condyle	62
Breadth of foramen magnum	26
Height of foramen magnum	21
Greatest length of malar bone	49
Breadth between external borders of lower margin of external auditory meatus	112
Shortest distance between the auditory bullæ (near their anterior ends)	33
Antero-posterior length of auditory bullæ	37
Length from lower border of foramen magnum to bottom of notch in middle of hinder border of palate	100
From the last-named spot to the anterior extremity of the præmaxilla	75
From anterior extremity of præmaxilla to hinder edge of posterior molar tooth	62
From anterior extremity of præmaxilla to anterior margin of orbit	53
Breadth between inner surfaces of posterior upper molar teeth	39
Breadth between upper canines	16
Length of ramus of mandible from anterior extremity to posterior edge of condyle	117
From anterior extremity to apex of subangular process	101
From the top of the coronoid process to the apex of the subangular process	55
From the posterior edge of the condyle to the anterior edge of the masseteric depression	45
Height of ramus opposite last molar tooth	21
Length of symphysis	22
Width between apices of subangular processes	63
Width between outer edges of condyles	100

2. On some Bats collected by Mr. F. Day in Burma.
By Professor W. Peters, F.M.Z.S.

[Received May 16, 1871.]

Mr. Sclater has very kindly sent to me a small collection of Bats from Burma, which, although consisting only of four species, contains a very interesting new form of *Rhinolophi*. This is a new proof how much is still to be done for a perfect knowledge of a very interesting, and in the household of nature very important, division of Mammalia, if only half as much care were taken to search for them as for the collection of doubtless much more attractive birds.

1. Cynonycteris amplexicaudata, Geoffroy.

Pteropus leschenaultii, Desmarest.

2. Phyllorhina fulva, Gray.

Hipposideros fulvus et *murinus*, Gray (1838) = *Rhinolophus fulgens* et *murinus*, Elliot (1838) = *Phyllorhina aurita*, Tomes (1859) = ? *Hipposideros aruensis*, Gray (1858).

This very distinct species, first known from Madras and Ceylon, has been found by Mr. Swinhoe in Amoy, is very likely identical with Dr. Gray's *H. aruensis*, and has therefore probably the same geographical distribution as *Ph. diadema*.

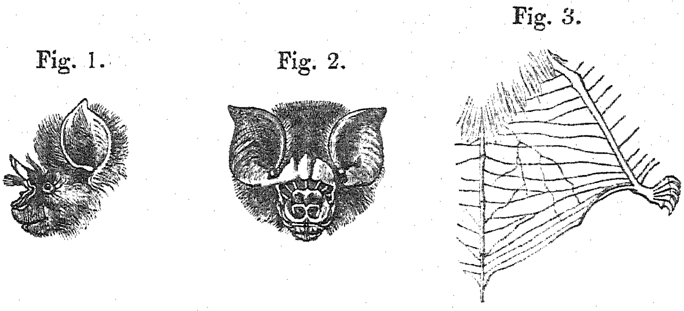
Fig. 1.
Fig. 2.
Fig. 3.

Phyllorhina trifida. (Natural size.)

Fig. 1. Head, from the side.
2. Head, in front.
3. Right hinder extremity, with the tail and interfemoral membrane.

3. Phyllorhina trifida, n. sp.

Auriculis mediocribus, basi dilatatis, apice acutis; prosthematis margine superiore trifido, haud incrassato: metacarpo tertio quarto breviore; patagiis tarso affixis; supra brunnea, subtus alba.

Related to *Ph. tridens* and *Ph. tricuspidata* in the form of the nose-leaf, the present species is easily to be distinguished from them by the characters given in the diagnosis.

The upper margin of the nose-leaf is not thickened as in those two species; and the three points are much larger. The ears are pointed, hardly longer, but much larger than in *Ph. tricuspidata.*

The fur is long and soft, that of the upperside and of the sides of the belly white with brown points, that of the middle of the belly entirely white.

The metacarpus of the third finger is shorter than that of the fourth finger, and not longer, as in *Ph. tridens* and *Ph. tricuspidata.*

The alar membrane is attached as far as the base of the metatarsus, and the point of the tail is much less (only for 3 millims.) exserted than in *Ph. tridens* and *tricuspidata.*

	metac.	1st ph.	2nd ph.	cartilage.	millims.
Total length					75
Head					16·5
Length of ear					12
Breadth of ear					10
Tail					30
Humerus					23
Ulna					40
Length of 1st finger	..	..	..	..	5
,, 2nd finger	29·5	0			
,, 3rd finger	27·5	14·2	23·2	2	
,, 4th finger	29·5	11·4	8·5	bifurcate	
,, 5th finger	23·5	12·2	9·5	,,	
Femur					17
Tibia					16·5
Foot, with claws					7
Spur					9

A single adult male was in the collection.

4. TAPHOZOUS LONGIMANUS, Hardwicke.

3. Notes on Mr. Theobald's observations on Dr. Gray's Paper on Tortoises. By Dr. J. E. GRAY, F.R.S. &c.

[Received May 22, 1871.]

In the 'Proceedings' of the Society for 1870, p. 674, there are some notes by Mr. Theobald on my paper on the families and genera of Tortoises, published in the 'Proceedings' of the Society for 1869, p. 165. I have very few remarks to make upon them, and take them in the order they occur. I may merely premise that zoologists generally give India its ancient and classical signification, and not the confined political one which certain Indian zoologists wish to apply to it.

Secondly, except nine specimens of Tortoises which Mr. Theobald gave to the museum, the museum purchased the collection which Mr. Theobald formed, from a dealer, to whom he had sold it, as a collection of Pegu reptiles.

None of the Tortoises had any special habitat of any kind attached to it; and the heads were not marked as coming from any particular species; so that if I made any mistakes in the habitats, or in saying the "thorax was unknown" of a head, it arose from the negligence of the collector, which is more unaccountable as we have since learnt that the collection consisted not only of the specimens Mr. Theobald collected in Pegu, but also of specimens that came from elsewhere, and which he obtained in exchange for other specimens from the Asiatic Society of Bengal. Mr. Theobald is not quite correct when he says I give "India" as the locality of *Scapia falconeri*. I gave India with a ?, and I gave the reason why I thought it might come from that country, and at the same time expressed my doubts.

It is just the same with some of the other observations on the habitats.

Thirdly, Mr. Theobald says he has no confidence whatever in the distinctness of species based on skulls only. My experience, which has been very considerable, has led to a very different conclusion; and Mr. Theobald did not seem to be aware of their importance in the distinguishing of the species of *Trionyx* and *Batagur* when he published his paper on the reptiles of Pegu, in the 'Journal of the Linnean Society,' vol. x. p. 16, or in the 'Catalogue of the Reptiles of Pegu,' else he certainly would have given more distinct characters to his species.

1. TESTUDO INDICA.

Mr. Theobald objects to this specific name. There is a very large number he can choose from; for, unfortunately, this species has been described under a number of names; but I prefer not to change one which is so well known, and which was the first given to it.

2. TESTUDO (SCAPIA) FALCONERI.

Mr. Theobald observes "that in default, therefore, of more exact information, the evidence before him pointed to the conclusion that the skull whereon *T. falconeri*, Gray, had been based was no other than the identical skull of *T. phayrei*, Blyth, missing from the Calcutta Museum." The only evidence there appears to be is, that there is a specimen of *T. phayrei* without a skull in that museum. There does not appear in the paper to be any attempt at comparing the figure of the skull with the head of the other, perfect specimen of this species in the museum, which, one would have supposed, a zoologist would have done before he made such a suggestion. I should be very glad to hear that such a comparison had been made, either with the head of the perfect specimen, or, what would be better, with fresh skulls of this Tortoise, which does not appear to be rare in "Burmah," or rather, I believe, in Arracan; then I should be very glad to adopt it, as it would erase a very imperfectly described nominal species from the list.

The interesting part of his notes is where Mr. Theobald says that *Testudo phayrei* is a true *Testudo*, with a regular sternum and separate caudal shield; therefore Mr. Blyth was in error when he informed me and Dr. Günther that *Manouria emys* was the same as his *T. phayrei*, an idea adopted by Mr. Theobald in his 'Catalogue of the Reptiles of Pegu,' and in his 'Catalogue of the Reptiles in the Museum of the Asiatic Society of Bengal,' where, after having seen the specimens, he placed it as *Manouria emys*.

It is to be observed that if the head should prove to be the same as the one on which my genus *Scapia* is founded, it will go to more firmly establish the propriety of having formed the genus *Scapia*, as *Testudo phayrei* has, according to Mr. Theobald, the hitherto unobserved combination of normal sternal shields, like *Testudo*, and separate caudal shields, like *Manouria* and the freshwater Tortoises, so that it forms a section or genus by itself.

Mr. Theobald believes that the skull on which *Scapia falconeri* was established belonged to this species. He may possibly be right; for it is a head of a large Land-Tortoise, of which we do not know the body, and which may perhaps come from India, or rather Hindostan; and *Testudo phayrei* is a large Land-Tortoise, the head or skull of which has not been described, although we now learn that the typical specimen has the head on it, and the general form and external characters of the skull are usually to be seen through the skin. I should probably have made this suggestion myself when I established the genus from the skull, and mentioned the characters by which it was known from the skulls of all the large Land-Tortoises then known; but the necessity of referring to the undescribed head of *T. phayrei* did not occur to me, as at that period I believed, on the authority of Mr. Blyth and Mr. Theobald, who had the specimens at their command, that it was the same as *Manouria*, with which I did compare it.

Mr. Theobald must excuse my not adopting his suggestion till an accurate comparison has been made between the skull of *T. phayrei* and *Scapia*, more especially as Mr. Theobald has already, with "culpable haste," referred the two typical specimens of *T. phayrei* to two species, indeed I may say genera, to which he now says they do not belong. It is to be hoped some competent zoologist will make the comparison which Mr. Theobald and his friends seem disinclined to do. Mr. Theobald further suggests that the skull which I described may have formerly belonged to a thorax in the Indian Museum. I must say I see no evidence of the fact worthy of a moment's notice, and it is a curious idea when they have not proved the identity of the two species; and the account of the state of the specimen and the manipulation it had undergone is so contradictory as to be utterly unworthy of credit. I must leave the question to the former and present curators of that museum, who know better their rules and manner of conducting the institution.

3. TESTUDO ELONGATA.

5. KACHUGA PEGUENSIS, 6. K. TRILINEATA, and 8. K. BERDMOREI.

I have already answered these remarks in my preliminary observations; and Mr. Theobald's impression that *K. peguensis* had been founded on a skull (probably aberrant) of either *Tetraonyx lessoni* or *Batagur trivittata*, and the idea that the skull of *Kachuga oldhami* is not distinct, do not require any answer from me.

If these skulls belong to the same animal, then the whole of the results of my examinations of Tortoise skulls, of which I must say I feel justly proud, must go for nothing; but Mr. Theobald has not discovered that *Kachuga oldhami* is the head of the well-known *Emys thurgi*, which proves to belong to the family *Bataguridæ*; and he surely will allow that *Tetraonyx lessoni*, *Batagur trivittata*, and *Emys thurgi* are distinct species, to whatever genera they may be referred.

The observations about the skulls of the males and females of *Kachuga trilineata*, under such circumstances, are not worth considering. I personally examined Mr. Theobald on his reasons for thinking the specimens which he brought home to be male and female of that species; and I thought they were very inconclusive, and required verification from an accurate and patient observer.

Testudo phayrei is not in my catalogue, therefore I give the synonyma of it:—

TESTUDO PHAYREI.

Testudo phayrei, Blyth, Journ. A. Soc. Beng. xvii. p. 56, xxiii. p. 639 (shortly described), xl. p. 77; Theobald, P. Z. S. 1870, p. 675.

Testudo indica, Theobald, Cat. Rept. Mus. As. Soc. Beng. p. 8.

Manouria emys, Theobald, Journ. Linn. Soc. x. p. 10, and Cat. Rep. Mus. As. Soc. Beng. p. 9.

"*Manouria emys*," Theobald, Cat. Rept. Mus. As. Soc. Beng. p. 9.

Hab. Arracan (*Blyth*); Burmah (*Theobald*).

As there is much confusion about *Manouria*, I take this opportunity of giving a revision of the synonyma:—

MANOURIA EMYS.

Testudo indica, Bibron's MS. in Mus. Zool Soc.

1844. *Testudo emys*, S. Müller, Verhandl. Reptiles, p. 34, t. iv.

1847. *Geoemyda spinosa* (adult), Cantor, Rept. Malay Penin.

1852. *Manouria fusca*, Gray, P. Z. S. 1852, p. 53; Ann. & Mag. Nat. Hist. 1855, vol. xv. p. 68; P. Z. S. 1860, p. 395; Ann. & Mag. Nat. Hist. 1861, vol. vii. p. 216; Cat. Shield Rept. p. 16, t. iii., Suppl. p. 15.

1854. *Teleophus luxatus*, Leconte, Pr. Acad. N. Sci. Phil. vii. p. 187 (Oct. 1854).

Manouria emys, Günther, Rept. Brit. India (not Theobald).

Hab. Penang (*Cantor*).

This animal has been curiously confounded with *Geoemyda spinosa*. Dr. Cantor, who first had it in a perfect state, in his list of Malay Reptiles considers it the adult of that species. Being desirous of obtaining the types of the species described by Solomon Müller, we purchased from Mr. Franks a series of specimens obtained from the Leyden Museum, with the labels of that institution attached to them. Having received in this series a young specimen of *Geoemyda spinosa* labelled *Testudo emys*, in the 'Catalogue of Shield Reptiles' I placed that species as a synonym of *Geoemyda spinosa*, not considering it necessary to consult the figure in Müller's book, or I should have discovered the mistake. Dr. Günther corrected this in his 'Reptiles of British India,' and properly changed the name from *Manouria fusca* into *Manouria emys*.

Mr. Theobald names this species "*Manouria emys*, Gray," instead of Schlegel or Günther; but there are many instances of want of accuracy of this kind, to which his note to *T. elongata* would be as applicable as to the oversight for which he quotes it.

M. A. Duméril, in his 'Catalogue of Reptiles,' p. 4. no. 7*, and in the 'Archives du Muséum,' described, under the name of *Testudo emydoides*, a specimen which he received from Leyden as *Testudo emys* of Müller; and his name is evidently a translation of the French name given to that species; but he does not mention the peculiar form of the pectoral plates, and it is very probable that he received, as the British Museum did, a young specimen of *Geoemyda spinosa* under a wrong name; and then his name and description will belong to the latter species and not to *Manouria*. They are very much alike, although belonging to different families.

4. A Monograph of the Lepidoptera hitherto included in the Genus *Elymnias*. By A. G. Butler, F.L.S., F.Z.S., &c.

[Received May 19, 1871.]

(Plate XLII.)

The present group of Butterflies is one of the most interesting of all the Rhopalocerous genera, not only because it exhibits a transition from the *Satyrinæ* to the *Brassolinæ* (see Cat. Fabr. Diurn. Lepid. p. 39), but because the species composing it are, almost without exception, of a mimetic character.

In the 'Genera of Diurnal Lepidoptera,' pp. 404, 405, only twelve species are enumerated; this number has since been more than doubled by the labours of Messrs. Hewitson, Wallace, Felder, and others, so that the genus is now beginning to assume a somewhat important aspect. I find, however, after a careful examination of the structural characters, that some of the species differ so considerably from the type form in the neuration of the hind wings that it will be advisable to separate them as a distinct genus; whilst others exhibit differences of a less marked character, such as will only serve in an imperfect manner to separate the smaller sections of the group. I have noticed that this transitional state of things often occurs in genera largely acted upon by mimicry*; and I think it may be explained from the fact that the necessity for the various species to resemble different protected forms brings about a modification in the general outline of the wing, and consequently the position of the nervures employed in expanding and supporting the wing is liable to be altered.

ELYMNIAS.

Elymnias, Hübner, Verz. bek. Schmett. p. 37 (1816).
Melanitis (part.), Fabricius, in Illiger's Mag. vi. p. 282 (1807).
Biblis (part.), Latreille, Enc. Méth. ix. p. 10 (1819).

Front wings triangularly ovate; costa arched; outer margin dentate sinuate; inner margin in males arched, sometimes with patch of thickened scales on interno-median area. Hind wings subtriangular, more or less dentate sinuate, the longest tooth being at end of third median branch, and sometimes caudate.

Front wings with costal nervure much swollen at base, reaching middle of costa; first subcostal branch emitted at some distance before end of cell, second just before end, third at first third of distance from cell to apex, and the fourth and fifth forking from second third; upper discoidal emitted close to subcostal, lower discoidal obliquely a little below upper, reducing upper discocellular to about one-fourth the length of lower, which is strongly concave; second and third median branches emitted close together.

Hind wings with first subcostal emitted at some distance before end of cell (nearer to end in *E. patna* than in any others); second subcostal and discoidal nervures emitted somewhat near together; upper discocellular horizontal, sometimes slightly oblique backwards (*E. penanga, panthera, casiphone, lais*, &c.) or forwards (*E. ceryx*); lower discocellular about four times the length of upper, strongly arched forwards (*E. undularis, panthera*, &c.) or backwards (*E. casiphone, lais*, &c.). The hind-wing cell therefore exhibits two external projections, one terminating in the second subcostal and discoidal, the other in the second and third median branches.

The species are all Asiatic, the type of the genus being *E. undularis*, Drury.

UNDULARIS group.

Colours. Males above black; front wings with discal series of lilac or lilac-tinted white spots; hind wings with more or less fulvous or ferruginous external area; below, all the wings marbled with ferruginous and whitish; hind wings generally with a conspicuous metallic subcostal spot.

Females above tawny or brown, with discal series of white or pale lilac spots; below paler than in males.

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* As for instance in the genus *Dismorphia* (*Leptalis*, auct.) of the *Pierinæ*.

1. ELYMNIAS UNDULARIS.

♂. *Papilio undularis*, Drury, Ill. ii. pl. 10. figs. 1, 2 (1773).

♀. *Papilio protogenia*, Cramer, Pap. Exot. ii. pl. 189. figs. F, G (1779).

♂. *Elymnias jynx*, Hübner, Zutr. ex. Schmett. figs. 37, 38 (1818).

♂, N. India (obtained 1843 and 1856); ♀, Silhet (1845); ♂ ♀, Moulmein (1843); ♂, Nepal (*Wright*, 1864); ♀, Java (*Horsfield*, 1851). B.M.

The female of *E. undularis* mimics *Danais chrysippus*.

2. ELYMNIAS NIGRESCENS, sp. n. (Plate XLII. fig. 1.)

♂. *Affinissima* E. undulari, *differt alis nigrescentibus, posticis extrorsum vix ferruginosis, punctis submarginalibus valde distinctis; subtus obscurioribus punctis albidis posticarum valde distinctis: exp. alar. unc.* 2, *lin.* 10.

♀. *Alæ supra fuscæ, anticæ nigrescentes, maculis discalibus lilacino-albidis velut in mare positis; posticæ punctis tribus quatuorve submarginalibus flavo-albidis: alæ subtus velut in* E. undulari ♀, *at obscuriores: exp. alar unc.* 3, *lin.* 1.

Sarawak (*Brooke*). ♂ ♀, B.M.

Very near to *E. undularis*, of which it is clearly a Bornean race. I know of nothing of which it is likely to be a mimic, unless it be a Bornean form of *Euplœa mazares*.

3. ELYMNIAS HECATE, sp. n. (Plate XLII. fig. 2.)

♂. *Alæ supra nigro-piceæ, purpureo certo situ micantes; anticæ striis sub quatuor subapicalibus lilacinis decrescentibus: subtus fuscæ ferrugineo, velut in* E. undulari *marmoratæ; posticæ haud maculatæ: exp. alar. unc.* 2, *lin.* 10.

Labuan (*Lowe*). ♂, B.M.

Another Bornean race of *E. undularis*, and possibly a mimic of *Euplœa mazares*.

4. ELYMNIAS FRATERNA, sp. n. (Plate XLII. fig. 3.)

♂. *Alæ supra piceæ; anticæ purpurascentes; margine externo et apice fulvis; posticæ margine externo late fulvo; alæ subtus fere velut in* E. undulari, *at duplo pallidiores: exp. alar. unc.* 3, *lin.* 1.

♀. *Fere velut in* E. undulari ♀, *at majores; posticæ maculis marginalibus majoribus: exp. alar unc.* 3, *lin.* 4.

Ceylon (*Wenham*). ♂ ♀, B.M.

The Ceylonese representative of *E. undularis*, its female being barely distinguishable from that species, and therefore also a mimic of *Danais chrysippus*; the male, however, is a very different-looking insect.

5. ELYMNIAS CAUDATA, sp. n. (Plate XLII. fig. 4.)

♂. *Alæ supra piceæ, anticæ areis interno-basali et externo fer-*

ruginosis; anticæ fascia subapicali et maculis tribus submarginalibus albis lilacino tinctis; posticæ dimidio externo fulvo, margine brunneo: alæ subtus ferrugineæ, velut in E. undulari ♀, *pulcherrime albo plagiatæ et reticulatæ: exp. alar. unc.* 3, *lin.* 5.

Canara (*Ward*). ♂, B.M.

The male is certainly not an imitation of any known protected species; I should, however, expect to find the female like *Danais chrysippus* or an allied species.

PANTHERA group.

Colours. Brown or black, with paler submarginal nebulous band on upper surface, sometimes whitish in female; below grey-brown, with ferruginous reticulations; hind wings with six submarginal ocelli.

6. ELYMNIAS LUTESCENS.

♀. *Elymnias lutescens*, Butler, Ann. & Mag. Nat. Hist. 3rd ser. xx. p. 404, pl. 9. fig. 10 (1867).

♂ ♀. *Elymnias lutescens*, Wallace, Tr. Ent. Soc. Lond. p. 323. n. 4 (1869).

Sarawak and Labuan (*Lowe*). ♂ ♀, B.M.

The examples from Labuan have the submarginal band of the front wings more distinct, and in the female becoming quite white towards apex. I do not, however, feel justified in separating them from the type. The Labuan form reminds one of the species of *Euplœa*, of the *Crameri* group; the resemblance, however, is somewhat imperfect. The species perhaps mimics some *Euplœa* near *E. lapeyrousei.*

7. ELYMNIAS PANTHERA.

Papilio panthera, Fabricius, Mant. Ins. p. 39. n. 407 (1787).

Melanitis dusara, Horsfield, Cat. Mus. E. I. C. pl. 5. fig. 7 (1829).

Java (*Horsfield*). B.M.

Probably mimics *Euplœa sepulchralis.*

PENANGA group.

Colours. Above grey, with broad subapical white band in front wings; below grey, reticulated with brown and white; hind wings sometimes with a metallic subcostal spot.

8. ELYMNIAS PENANGA.

Melanitis penanga, Westwood, Gen. D. L. p. 405. n. 9, note (1851).

Penang (received 1840). Type, B.M.

9. ELYMNIAS SUMATRANA.

Elymnias sumatrana, Wallace, Trans. Ent. Soc. Lond. p. 325. n. 10 (1869).

Melanitis penanga, Hewitson, Ex. Butt. iii. *Mel.* pl. 1. fig. 1 (1863).

Sumatra (*Wallace*).

I know of nothing which *E. penanga* and *sumatrana* resemble mimetically.

LAIS group.

Colours. Similar to those of the pale green species of *Danais.*

10. ELYMNIAS LAIS.

Papilio lais, Cramer, Pap. Exot. ii. pl. 114. figs. A, B (1779).

Java (*Horsfield*). ♀ ♂, B.M.

Probably mimics *Danais grammica,* but perhaps *D. similis.*

11. ELYMNIAS TIMANDRA.

♂ ♀. *Elymnias timandra,* Wallace, Trans. Ent. Soc. London, p. 326. n. 13 (1869).

♂, Silhet (obtained 1845); ♀, Moulmein (1843). Types, B.M.

Probably mimics *D. similis.* It is, however, impossible to determine with certainty which species it would most nearly resemble when flying.

12. ELYMNIAS CERYX.

♀. *Melanitis ceryx,* Boisduval, Sp. Gén. Lép. i. pl. 9. fig. 8 (1836).

Java (obtained 1849). ♀, B.M.

Mimics *Danais albata.*

The male is described by Mr. Wallace in the 'Transactions of the Entomological Society.'

13. ELYMNIAS KAMARA.

♂. *Melanitis kamara,* Moore, Cat. Lep. E. I. C. i. p. 239. n. 516 (1857).

Java (obtained 1845). ♂, B.M.

Seems to mimic some *Euplœa* allied to *E. modesta.*

LEUCOCYMA group.

Colours. Both sexes resemble *Euplœa midamus* and allies.

14. ELYMNIAS CASIPHONE.

♂. *Elymnias casiphone,* Hübner, Samml. ex. Schmett. iii. (1816–1824).

♀. *Elymnias casiphone,* Butler, Trans. Ent. Soc. London, p. 488 (1870).

♂, Java (*Horsfield,* B. M.); ♀, Singapore, coll. Lieut. Roberts.

15. ELYMNIAS LEUCOCYMA.

Biblis leucocyma, Godart, Enc. Méth. ix. p. 326. n. 3 (1819).

♂. *Melanitis malelas,* Hewitson, Ex. Butt. iii. *Mel.* pl. 1. figs. 6, 7 (1863).

♂ ♀, Silhet (obtained 1845). B.M.

16. Elymnias mehida.

Melanitis mehida, Hewitson, Ex. Butt. iii. *Mel.* pl. 1. figs. 2, 3 (1863).

Singapore.

Genus Dyctis, Boisduval.

Front wings as in preceding genus.

Hind wings with false prædiscoidal cell; first subcostal emitted towards end of cell, nearer to the end in the females than in the males; second and discoidal emitted somewhat near together; upper discocellular more or less oblique (excepting in *D. mimalon*, ♂), slanting outwards; lower discocellular feebly concave or angulated, and about twice the length of upper; second and third median branches emitted near together.

Typical species *D. agondas*, Boisd.

The species are Asiatic or African.

1. Dyctis agondas.

♂. *Dyctis agondas*, Boisduval, Voy. de l'Astrolabe, Lep. p. 158, pl. 3. fig. 5 (1832).

♀. *Dyctis bioculatus*, Westwood, Gen. D. L. p. 354, pl. 54*. fig. 4 (1851).

Dorey (*Wallace*). ♂ ♀, B.M.

Mimics *Drusilla bioculatus*.

2. Dyctis melane.

♂ ♀. *Melanitis melane*, Hewitson, Proc. Zool. Soc. p. 465, pl. 55 (1858).

Aru (*Wallace*). ♂ ♀, B.M.

Mimics several species of *Drusilla*. It is difficult to separate the various forms figured by Mr. Hewitson, as it is obvious that the female is subject to much variation.

3. Dyctis melantho.

♂ ♀. *Elymnias melantho*, Wallace, Trans. Ent. Soc. London, p. 330. n. 30 (1869).

Gagie Island (*Wallace*).

A local form of the preceding species.

4. Dyctis esaca.

♂. *Melanitis esaca*, Westwood, Gen. D. L. p. 405. n. 10, note (1851); Hewitson, Ex. Butt. iii. pl. *Mel.* 1. fig. 5 (1863).

Assam (obtained 1848). Type ♂, B.M.

This species is stated by Hewitson and Westwood to be East-Indian. I find, however, that we obtained it through Mr. Warwick, from Assam. It probably mimics some form of *Euplœa* allied to *E. ledereri*.

5. Dyctis hewitsonii.

Elymnias hewitsonii, Wallace, Trans. Ent. Soc. Lond. p. 327. n. 20 (1869).

♂. *Melanitis leucocyma*, Hewitson, Proc. Zool. Soc. p. 53, pl. 9. figs. 3, 4 (1861).
Macassar, Celebes (Wallace). ♂ ♀, B.M.
Mimics *Euplœa mniszechii* or *E. gloriosa*, apparently the former.

6. Dyctis hicetas.

♂. *Elymnias hicetas*, Wallace, Trans. Ent. Soc. London, p. 327. n. 21 (1869).
Macassar, Celebes (*Wallace*).
This seems to differ but little from the preceding, of which I strongly suspect it to be a variety.

7. Dyctis cumæa.

Melanitis cumæa, Felder, Nov. Voy. Lep. iii. p. 452. n. 745, pl. 61. figs. 9, 10 (1867).
Gilolo.
Nearly allied to the preceding.

8. Dyctis mimalon.

Melanitis mimalon, Hewitson, Proc. Zool. Soc. London, p. 52, pl. 9. figs. 1, 2 (1861).
Menado, Celebes. ♂, B.M.
The finest species in the genus. It appears not to mimic anything.

9. Dyctis vitellia.

Papilio vitellia, Cramer, Pap. Exot. iv. pl. 349. figs. E, F (1782).
? *Euplœa vitella*, Montr. Ann. Sc. Phys. Nat. Lyon. p. 403 (1856).
Melanitis stellaris, Vollenhoven, Tijd. voor Ent. iv. p. 159, pl. 8. fig. 3 (1862).
Var. *Elymnias viminalis*, Wallace, Trans. Ent. Soc. London, p. 328. n. 25 (1869).
Amboina (*Wallace*). B.M.
Mimics *Euplœa climene*.

10. Dyctis cybele.

Melanitis cybele, Felder, Wien. ent. Monatschr. iv. p. 248. n. 98 (1860).
Batchian, Kaioa Island, Ternate (*Wallace*).
This species is unknown to me; it probably resembles one of the dark *Euplœæ*.

11. Dyctis papua.

Elymnias papua, Wallace, Trans. Ent. Soc. London, p. 329. n. 28 (1869).
New Guinea (*Wallace*).
Mr. Wallace says that "this species closely resembles a *Euplœa*." Unfortunately he does not mention which *Euplœa*.

12. DYCTIS MELIAS.

Melanitis melias, Felder, Wien. ent. Monats. vii. p. 120. n. 91 (1863); Nov. Voy. Lep. iii. pl. 61. fig. 11 (1867).
Bourias, Locban [Philippines].
Mimics *Euplœa swainsonii.*

13. DYCTIS PATNA.

♀. *Melanitis patna*, Westwood, Gen. D. L. p. 405. n. 6, note, pl. 68. fig. 2 (1851).
Silhet (obtained 1847). Type, B.M.
Mimics *Euplœa callithoë*, a species allied to *E. splendens* and *E. superba*. It bears a superficial resemblance to *Elymnias leucocyma*.

14. DYCTIS EGIALINA.

Melanitis egialina, Felder, Wien. ent. Monatschr. vii. p. 121. n. 92 (1863); Nov. Voy. Lep. iii. pl. 61. figs. 7, 8 (1867).
Luzon [Philippines].
Mimics *Delias henningia* (*Pierinæ*).

15. DYCTIS BORNEENSIS.

Elymnias borneensis, Wallace, Trans. Ent. Soc. London, p. 324. n. 8 (1869).
Sarawak [Borneo].
Doubtless mimics some species of *Delias* (an *D. porsenna* ?).

16. DYCTIS VASUDEVA.

Elymnias vasudeva, Moore, Cat. Lep. E. I. C. i. p. 238. n. 513 (1857).
Elymnias thycana, Wallace, Trans. Ent. Soc. Lond. p. 323. n. 7 (1869).
♂, Nepal (*Wright*); India (obtained 1856); ♀, Barrackpore (*Hearsey*). B.M.
Mimics either *Delias descombesi* or *D. indica*; it is impossible to say which without seeing it alive.

17. DYCTIS BAMMAKOO.

♂. *Melanitis bammakoo*, Westwood, Gen. D. L. p. 405. n. 12, note, pl. 68. fig. 3 (1851).
Ashanti (obtained 1842). Type, B.M.
Mimics *Planema gea* ♀ (*Acræinæ*).
Several males in Mr. Swanzy's collection.

18. DYCTIS PHEGEA.

Papilio phegea, Fabricius, Ent. Syst. iii. 1. p. 132. n. 407 (1793); Donovan, Ins. Ind. pl. 31. fig. 1 (1800).
West Africa. ♂, coll. Druce.
Mimics *P. gea* ♂.

5. A Revision of the Species formerly included in the Genus *Terias* (*Pierinæ*). By A. G. BUTLER, F.L.S., F.Z.S., &c.

[Received May 22, 1871.]

My principal object in the present paper is to refer the species of this very difficult group to the genera into which I separated it in my "Revision of the Genera of the Subfamily *Pierinæ*" (Cist. Ent. iii. pp. 33–58). I shall not, therefore, increase the difficulty of determining the already numerous and nearly allied species by describing all the unnamed forms at my disposal, but shall rather strive to lighten the labours of my fellow-workers by clearing up, to the best of my ability, the somewhat confused synonymy already existing.

As one or two of the species of *Elodina* have been confounded by some Lepidopterists with *Terias*, I shall introduce that little genus into the present paper.

Genus 1. ELODINA, Felder,
Reise Nov. Lep. ii. p. 215 ("1865").

1. **ELODINA EGNATIA.**

Pieris egnatia, Godart, Enc. Méth. ix. p. 138. n. 63 (1836).
Pieris cirrha, Boisduval, Voy. de l'Astrolabe, pl. 2. f. 7 (1832).
Pieris parthia, Hewitson, Ex. Butt. i. *Pier.* 2. f. 12, 13 (1853).
Var.? *Elodina hypatia*, Felder, Reise Nov. Lep. ii. p. 216. n. 233 ("1865").
Var.? *Elodina therasia*, Felder, *l. c.* p. 215. n. 232 ("1865").
Australia. Coll. B.M.

2. **ELODINA BOURUENSIS.**

Elodina bouruensis, Wallace, Trans. Ent. Soc. London, 3. iv. p. 319. n. 4 (1867).
Bouru (*Wallace*); id.? Aru (*Wallace*). Coll. B.M.
Nearly allied to *E. egnatia*, but apparently distinct.

3. **ELODINA ANGULIPENNIS.**

Terias angulipennis, Lucas, Rev. Zool. p. 431 (1852).
Pieris pallene, Hewitson, Ex. Butt. i. *Pier.* pl. 2. f. 8, 9 (1853).
Richmond River, Moreton Bay, Port Macquarie. Coll. B.M.

4. **ELODINA PADUSA.**

Pieris padusa, Hewitson, Ex. Butt. i. *Pier.* pl. 2. f. 10, 11 (1853).
Australia. Coll. B.M.
Nearly allied to the preceding species.

5. **ELODINA SIGNATA.**

Elodina signata, Wallace, Trans. Ent. Soc. London, 3. iv. p. 319. n. 8 (1867).
New Caledonia. B.M.

Genus 2. SPHÆNOGONA, Butler*,
Cist. Ent. iii. p. 44. gen. 15, pl. 1. f. 13 (1870).

1. SPHÆNOGONA GRATIOSA.

Terias gratiosa, Hewitson, Gen. Diurn. Lepid. pl. 9. f. 5 (1847).
Venezuela. B.M.

2. SPHÆNOGONA ECUADORA.

Terias ecuadora, Hewitson, Equat. Lep. p. 2. n. 2 (1869).
Ecuador (*Buckley*).
A beautiful species allied to *S. gratiosa*.

3. SPHÆNOGONA INGRATA.

Terias ingrata, Felder, Verh. zool.-bot. Ges. Wien, p. 465. n. 1 (1869).
Terias gratiosa, Reakirt, Proc. Ent. Soc. Phil. ii. p. 359. n. 3 (1863).
Mexico; Chontales; Nicaragua; Polochic Valley. B.M.

4. SPHÆNOGONA XANTOCHLORA.

♀. *Terias xantochlora*, Kollar, Denkschr. Akad. Wiss. Wien, math.-nat. Cl. i. p. 363. n. 36 (1850).
♂. *Terias bogotana*, Felder, Wien. ent. Mon. v. p. 84. n. 41 (1861).
Terias chloë, Felder, Reise Nov. Lep. ii. p. 199. n. 202 ("1865").
Terias gaugamela, Felder, *l. c.* n. 203, pl. 26. f. 5 ("1865").
Bogota. ♀ ♂, B.M.

The above species described by the Felders appear to me to be identical with *T. xantochlora*.

5. SPHÆNOGONA LIMONEUS.

Terias limoneus, Felder, Wien. ent. Mon. v. p. 84. n. 43 (1861); Reise Nov. Lep. ii. p. 200. n. 204 ("1865").
Venezuela.
Seems nearly allied to *S. xantochlora*.

6. SPHÆNOGONA SALOME.

Terias salome, Felder, Wien. ent. Mon. v. p. 84. n. 42 (1861); Reise Nov. Lep. ii. p. 201. n. 206 ("1865").
Ecuador (*Felder*); Bolivia. B.M.

Dr. Felder says of this species, "The only male in our collection is larger than *T. constantia* just described; the wings are as broad as in *T. xantochlora*, Koll., and the hind wings more distinctly angulate."

7. SPHÆNOGONA JAMAPA.

♀. *Terias jamapa*, Reakirt, Proc. Ac. Nat. Sci. Phil. p. 239. n. 5 (1866).
Mexico.

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* The type of this genus is an undescribed species from Archidona, allied to *S. constantia*, ♂, Felder; Doubleday gives Quito as the habitat, but we have no species of this group from that locality.

8. SPHÆNOGONA THEODES.

♀. *Terias theodes*, Felder, Wien. ent. Mon. v. p. 85. n. 45 (1861); Reise Nov. Lep. ii. p. 201. n. 207 ("1865").
♂. *Terias constantia*, Felder, *l. c.* n. 205 ("1865").
Venezuela. B.M.

9. SPHÆNOGONA THEONA.

Terias theona, Felder, Reise Nov. Lep. ii. p. 202. n. 208 ("1865").
♀. *Terias theodes*, Felder, Wien. ent. Mon. v. p. 85. n. 45 (1861).
Venezuela.
Allied to *S. theodes*, but smaller; the wings shorter.

10. SPHÆNOGONA FABIOLA.

Terias fabiola, Felder, Wien. ent. Mon. v. p. 85. n. 44 (1861); Reise Nov. Lep. ii. p. 199. n. 201 ("1865").
Venezuela. B.M.

11. SPHÆNOGONA ARBELA.

Eurema arbela, Hübner, Zutr. ex. Schmett. f. 641, 642 (1832).
Brazil.
Not in British Museum. Allied to *S. salome*, from which it chiefly differs in the broader marginal band of the hind wings.

12. SPHÆNOGONA BOGOTANA.

Terias bogotana, Felder, Wien. ent. Mon. v. p. 84. n. 41 (1861); Reise Nov. Lep. ii. p. 198. n. 199, pl. 26. f. 3, 4 ("1865").
Bogota.
Allied to *S. arbela*.

13. SPHÆNOGONA MEXICANA.

Terias mexicana, Boisduval, Sp. Gén. Lép. i. p. 655. n. 5, pl. 3 c. f. 1 (1836).
Terias boisduvaliana, Felder, Reise Nov. Lep. ii. p. 200 ("1865").
Mexico. B.M.

14. SPHÆNOGONA DAMARIS.

Terias damaris, Felder, Reise Nov. Lep. ii. p. 200 ("1865").
♀. *Terias mexicana*, Boisduval, Sp. Gén. Lép. i. p. 655. n. 3 (1836).
Terias depuiseti, Boisd. Lép. Guatemala, p. 11 (1870).
Mexico; Guatemala.

15. SPHÆNOGONA? ZELIA.

Terias zelia, Lucas, Rev. Zool. p. 430 (1852).
Colombia.

16. SPHÆNOGONA? ANGULATA.

Terias angulata, Wallengren, Wien. ent. Mon. iv. p. 34. n. 3 (1860).
Sandwich Islands.

Genus 3. Leucidia, E. Doubleday, Gen. Diurn. Lepid. p. 77 (1847).

1. Leucidia elvina.

Terias elvina, Swainson, Zool. Ill. 1st ser. pl. 22 (1820).
Pernambuco. B.M.

2. Leucidia brephos.

Mancipium vorax brephos, Hübner, Samml. ex. Schmett. i. pl. 143 (1806–27).
Venezuela; Pará. B.M.

3. Leucidia leucoma.

Terias leucoma, Bates, Journ. Entom. i. p. 241. n. 16 (1861).
Leucidia elphos, Felder, Wien. ent. Mon. vi. p. 69. n. 17 (1862).
Upper Amazons.
Close to the preceding, if not a variety of it.

Genus 4. Terias, Swainson, Zool. Ill. 1st ser. pl. 22 (1820).

1. Terias clara.

Terias clara, Bates, Journ. Entom. i. p. 243. n. 12 (1861).
Leucidia exigua, Prittwitz, Stett. ent. Zeit. p. 133. n. 1 (1865).
Var. *Leucidia pygmæa*, Prittwitz, *l. c.* p. 133. n. 2 (1865).
Tapajos; Honduras. B.M.
I believe *L. pygmæa* to be merely a dwarfed form of the species; our examples vary immensely in size.

2. Terias impura.

Terias impura, Vollenhoven, Mon. Pier. p. 70. n. 11, pl. 7. f. 5 (1865).
Timor.
Curiously like *T. clara*.

3. Terias lirina.

Terias lirina, Bates, Journ. Entom. i. p. 244. n. 15 (1861).
Pará (*Bates*).
Closely allied to *T. clara*.

4. Terias albula.

Papilio albula, Cramer, Pap. Exot. i. pl. 27. f. E (1775).
♀. *Mancipium fugax Nise*, Hübner, Samml. ex. Schmett. i. pl. 146. f. 3, 4 (1806–27).
Pernambuco; Demerara; Venezuela. B.M.

5. Terias? pasiphaë.

Papilio pasiphaë, Cramer, Pap. Exot. i. pl. 80. f. E (1779).
Surinam (*Cramer*).
May come near *T. albula*, but is larger than any known species of that group; possibly the female of *Pandemos arcas*.

6. TERIAS MARGINELLA.

Terias marginella, Felder, Wien. ent. Mon. v. p. 97. n. 53 (1861).
Venezuela; Panamá; Bogotá. B.M.
Scarcely distinct from *T. albula*.

7. TERIAS SINOË.

Pieris sinoë, Godart, Enc. Méth. ix. p. 138. n. 66 (1819).
Papilio cassiæ, Sepp, Surin. Vlind. ii. pl. 56 (1848).
Terias celata, Felder, Verh. zool.-bot. Ges. Wien, p. 466. n. 4 (1869).
Var. *Terias leucilla*, Felder, *l. c.* n. 5 (1869).
Rio Grande; Honduras; Panamá. B.M.

8. TERIAS GNATHENE.

Terias gnathene, Boisduval, Sp. Gén. Lép. i. p. 680. n. 46 (1836); Hübner, Zutr. ex. Schmett. f. 937, 938 (1837).
Jamaica; Honduras. B.M.

9. TERIAS AMELIA.

Terias amelia, Poey, Mem. Hist. Nat. de Cuba, p. 253. n. 12, pl. 18. f. 11–13 (1851).
Cuba.
Nearly allied to the preceding.

10. TERIAS MESSALINA.

Papilio messalina, Fabricius, Mant. Ins. p. 22. n. 235 (1787).
Terias bulæa, Boisduval, Sp. Gén. Lép. i. p. 680. n. 47 (1836).
Eurema arabella, Hübner, Zutr. ex. Schmett. f. 973, 974 (1837).
Terias deflorata, Kollar, Denkschr. Akad. Wiss. i. p. 363. n. 37 (1850).
Terias iradia, Poey, Mem. Hist. Nat. de Cuba, p. 253. n. 13, pl. 18. f. 14–17 (1851).
Jamaica; Honduras. B.M.

11. TERIAS MANA.

Terias mana, Boisduval, Sp. Gén. Lép. i. p. 681. n. 49 (1836).
Bolivia. B.M.

12. TERIAS AGAVE.

Papilio agave, Cramer, Pap. Exot. i. pl. 20. f. H, I (1775).
Eurema jodutta, Hübner, Verz. bek. Schmett. p. 96. n. 1019 (1816).
Pieris phiale (part.), Godart, Enc. Méth. ix. p. 157. n. 61 (1819).
Brazil; Pernambuco. B.M.

13. TERIAS PHIALE.

Papilio phiale, Cramer, Pap. Exot. i. pl. 27. f. F (1775).
Surinam.
Seems allied to *T. agave*; and is probably identical with *T. musa*, Fabr.

14. TERIAS TAPEINA.

Terias tapeina, Bates, Journ. Entom. i. p. 244. n. 14 (1861).
Para (*Bates*).
Belongs to the *Agave* group.

15. TERIAS LUCINA.

Terias lucina, Poey, Mem. Hist. Nat. de Cuba, p. 252. n. 11, pl. 18. f. 8–10 (1851).
Terias arabella, Lucas, Hist. Cuba, vii. p. 515, pl. 16. f. 5, 5ª (1856).
Cuba.
Belongs to the *Agave* group.

16. TERIAS MUSA.

Papilio musa, Fabricius, Ent. Syst. iii. p. 195. n. 607 (1793).
Terias gentilis, Boisduval, Sp. Gén. Lép. i. p. 658. n. 9 (1836).
Terias columbia, Felder, Wien. ent. Mon. v. p. 86. n. 48 (1861).
Bogota. B.M.

17. TERIAS FORNSI.

Terias fornsi, Poey, Mem. Hist. Nat. de Cuba, p. 443. n. 13 (1851).
Isle of Pines (*Gundlach*).
Allied to *T. lucina* and *amelia* of Poey.

18. TERIAS CONJUNGENS.

Terias conjungens, Herrich-Schäffer, Corr.-Blatt. Regensb. xviii. p. 167 (1864).
Cuba.
Next to *T. fornsi*; differs from it and *T. lucina* in its broader border, which more nearly approaches the inner margin.

19. TERIAS EUGENIA.

Terias eugenia, Wallengren, Wien. ent. Mon. iv. p. 33. n. 2 (1860).
?*Terias cubana*, Herrich-Schäffer, Corr.-Blatt. Regensb. xviii. p. 166 (1864).
Honduras; Haiti. B.M.

20. TERIAS EBRIOLA.

Terias ebriola, Poey, Mem. Hist. Nat. de Cuba, p. 250. n. 9, pl. 24. f. 7–13 (1851).
Cuba.
Allied to *T. platæa* and *T. palmira*; possibly a variety of *T. eugenia*.

21. TERIAS JUCUNDA.

Terias jucunda, Boisduval et Leconte, Lép. Am. Sept. pl. 19. f. 1–3 (1827).
Var. *Terias lemnia*, Felder, Reise Nov. Lep. ii. p. 205. n. 213 (1865).
United States. B.M.

22. TERIAS PALMIRA.

Terias palmira, Poey, Mem. Hist. Nat. de Cuba, p. 249. n. 8, pl. 24. f. 4–6 (1851).

Terias vitellina, Felder, Wien. ent. Mon. v. p. 86. n. 49 (1861).

Var. *Terias tegea*, Felder, Reise Nov. Lep. ii. p. 203. n. 210 (1865).

Var. ? *Terias lydia* (part.), Felder, Wien. ent. Mon. v. p. 87. n. 50 (1861).

Terias phœnicia, Felder, Reise Nov. Lep. ii. p. 205. n. 214 (1865).

Nicaragua; Panamá; Venezuela; Honduras. B.M.

23. TERIAS MEDUTINA.

Terias medutina, Felder, Wien. ent. Mon. v. p. 97. n. 52 (1861).

Venezuela.

Near *T. palmira*.

24. TERIAS SIDONIA.

Terias sidonia, Felder, Verh. zool.-bot. Ges. Wien, p. 465. n. 2 (1869).

Mexico. B.M.

25. TERIAS MYCALE.

Terias mycale, Felder, Reise Nov. Lep. ii. p. 204. n. 210 (1865).

Bahia (*Felder*); id.? Pernambuco. ♂ ♀, B.M.

26. TERIAS PLATÆA.

Terias platæa, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 474. n. 18 (1862).

Pernambuco; Brazil; Pará. B.M.

27. TERIAS ELATHEA.

♂. *Papilio elathea*, Cramer, ii. pl. 99. f. C, D (1776).

♀. *Terias midea*, Ménétriés, Nouv. Mém. Soc. Imp. Mosc. iii. pl. 11. f. 6 (1834).

Jamaica. B.M.

28. TERIAS ALBINA.

♀. *Terias albina*, Poey, Mem. Hist. Nat. de Cuba, p. 251. n. 10. pl. 24. f. 14–16 (1851).

Cuba.

Seems to be a slight variety of the preceding.

29. TERIAS RHODIA.

Terias rhodia, Felder, Wien. ent. Mon. v. p. 97. n. 51 (1861).

Terias elathea, var. *a*, Boisduval, Sp. Gén. Lép. i. p. 665 (1836).

Bogota. B.M.

30. TERIAS LYDIA.

Terias lydia, Felder, Wien. ent. Mon. v. p. 87. n. 50 (1861).

Venezuela (*Felder*); id.? ♂ ♀, B.M.

31. TERIAS DELIA.

Papilio delia, Cramer, Pap. Exot. iii. pl. 273. f. A (1780).
Eurema demoditas, Hübner, Verz. bek. Schmett. p. 96. n. 1016 (1816).
Pieris daira, Godart, Enc. Méth. ix. p. 137. n. 59 (1819).
United States; and var. West Coast of Mexico. B.M.

32. TERIAS STYGMULA.

Terias stygmula, Boisduval, Sp. Gén. Lép. i. p. 661. n. 15 (1836).
Honduras. B.M.

33. TERIAS EUTERPE.

Colias euterpe, Ménétriés, Nouv. Mém. Soc. Imp. Mosc. iii. pl. 11. f. 4 (1834).
Pieris thymetus, Godart (nec Fabricius), Enc. Méth. ix. Suppl. 814. n. 56, 57 (1823).
♀. ?*Terias perimede*, Prittwitz, Stett. ent. Zeit. p. 134 (1865).
Var. *Terias sulphurina*, Poey, Mem. Hist. Nat. de Cuba, pl. 18. f. 1–3 (1851).
Jamaica; Haiti. B.M.

34. TERIAS LISA.

Xanthidia lisa, Boisduval et Leconte, Lép. Am. Sept. pl. 19. f. 4, 5 (1827).
Pieris smilda, Godart, Enc. Méth. ix. p. 136. n. 56 (1819).
North America; Illinois; East Florida. B.M.

35. TERIAS NICIPPE.

Papilio nicippe, Cramer, Pap. Exot. iii. pl. 210. f. C, D (1782).
Ohio; Philadelphia; Georgia; East Florida. B.M.

36. TERIAS HYONA.

Colias hyona, Ménétriés, Nouv. Mém. Soc. Imp. Mosc. iii. pl. 11. f. 5 (1834).
St. Domingo. B.M.

37. TERIAS PYRO.

Pieris pyro, Godart, Enc. Méth. ix. p. 137. n. 60 (1819).
St. Domingo.
May not this be the female of *T. hyona*?

38. TERIAS DESJARDINSII.

Xanthidia desjardinsii, Boisduval, Faun. Madag. p. 22. n. 3 pl. 2. f. 6 (1833).
Madagascar.
Seems from the figure to be very like the male of *T. hyona*.

39. TERIAS LÆTA.

Terias læta, Boisduval, Sp. Gén. Lép. i. p. 674. n. 36 (1836).

Terias jægeri, Ménétriés, Enum. Corp. Anim. i. pl. 2. f. 1 (1855).
Affghanistan; Landoor; Bhotan. B.M.

M. Ménétriés states that his *T. jægeri* and the two other Indian species figured on the same plate are from Haiti.

40. TERIAS MANDARINA.

Terias mandarina, De l'Orza, Lep. Japon. p. 18 (1869).
Japan.

Seems to belong to the *læta* group, but is not very near to any thing in the British Museum.

41. TERIAS VAGANS.

Terias vagans, Wallace, Proc. Zool. Soc. p. 357. n. 10 (1866).
North India. B.M.

Allied to *T. læta*, which it resembles in the shape of its wings.

42. TERIAS HERLA.

Terias herla, M^cLeay, King's Survey Austr. ii. p. 460. n. 144 (1827).
Australia, Cape York. B.M.

43. TERIAS LIBYTHEA.

Papilio libythea, Fabricius, Ent. Syst. Suppl. p. 427 (1798).
Terias parvula, Herrich-Schäffer, Stett. ent. Zeit. p. 78. n. 54 (1869).
Var.? *Terias lerna*, Felder, Sitzb. Ak. Wiss. Wien, math.-nat. Cl. xl. p. 448 (1860).
Var. *Terias zoraide*, Felder, Reise Nov. Lep. ii. p. 213. n. 229 ("1865").
Terias australis, Wallace, Trans. Ent. Soc. 3, iv. p. 321. n. 9 (1867).
Canara; Darjeeling; Moreton Bay; Rockingham Bay; Sandy Point. B.M.

44. TERIAS PULCHELLA.

Xanthidia pulchella, Boisduval, Faune Ent. de Madag. pl. 2. f. 7 (1833).
Madagascar; Mauritius. B.M.

45. TERIAS DRONA.

Terias drona, Horsfield, Cat. Lep. E. I. C. pl. 1. f. 13 (1829).
North India; Punjaub. B.M.

46. TERIAS BRIGITTA.

Papilio brigitta, Cramer, Pap. Exot. iv. pl. 331. f. B, C (1782).
Var. *Terias rahel*, Boisduval, Sp. Gén. Lép. i. p. 673. n. 34 (1836).
Terias zoë, Hopffer, Ber. (1855); Peters, Reise Zool. v. pl. 23. f. 10, 11 (1862).
Terias drona, Wallengren, Lep. Rhop. Caffr. p. 19 (1857).

Var. *Terias caffra*, Felder, Reise Nov. Lep. ii. p. 213 (1865).
Congo; Ashanti; Port Natal; Zoolu. B.M.

47. TERIAS SANTANA.

Terias santana, Felder, Reise Nov. Lep. ii. p. 211. n. 225 ("1865").
Terias rubella, Wallace, Trans. Ent. Soc. 3, iv. p. 323. n. 15 (1867).
Var. *Terias senna*, Felder, Reise Nov. Lep. ii. p. 212. n. 226 ("1865").
North India; China. B.M.

48. TERIAS VENATA.

Terias venata, Moore, Cat. Lep. E. I. C. p. 65. n. 117, pl. 2ª. f. 2 (1857).
Punjaub. B.M.

Nearly allied to *T. drona*, but with a narrower regular margin to hind wings.

49. TERIAS SMILAX.

Terias smilax, Donovan, Ins. New Holland, pl. 20. f. 3 (1805).
Australia.

Seems to come near to *T. sinta* of Wallace; but more nearly resembles *T. smilacina*, ♂, in the figure.

50. TERIAS SINTA.

Terias sinta, Wallace, Trans. Ent. Soc. 3, iv. p. 322. n. 11 (1867).
Moreton Bay. B.M.

51. TERIAS INGANA.

Terias ingana, Wallace, Trans. Ent. Soc. 3, iv. p. 322. n. 10 (1867).
Sidney. B.M.

52. TERIAS FLORICOLA.

Xanthidia floricola, Boisduval, Faune Ent. de Madag. p. 21 (1833).
Mauritius; Madagascar. B.M.

53. TERIAS BRENDA.

Terias brenda, Doubleday et Hewitson, Gen. Diurn. Lepid. pl. 9. f. 6 (1847).
Sierra Leone; Ashanti; Angola. B.M.

54. TERIAS BLANDA.

Terias blanda, Boisduval, Sp. Gén. Lép. i. p. 672. n. 32 (1836).
Terias phanospila, Felder, Reise Nov. Lep. ii. p. 209. n. 221 (1865).
China. B.M.

55. TERIAS SENEGALENSIS.

Terias senegalensis, Boisduval, Sp. Gén. Lép. i. p. 672. n. 31 (1836); Hübner, Zuträge ex. Schm. f. 969, 970 (1837).

Var. *Terias candace*, Felder, Reise Nov. Lep. ii. p. 213. n. 228 ("1865").
Sierra Leone; White Nile. B.M.

56. TERIAS SUAVA.

Terias suava, Boisduval, Sp. Gén. Lép. i. p. 670. n. 28 (1836).
Terias anemone, Felder, Wien. ent. Mon. vi. p. 23. n. 7 (1862).
China. B.M.

57. TERIAS NIKOBARIENSIS.

Terias nikobariensis, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 480 (1862).
Ceylon. B.M.
Near to *T. suava* of Boisduval.

58. TERIAS ÆSIOPE.

Terias æsiope, Ménétriés, Enum. Corp. Anim. in Cat. Mus. Petr. Lep. i. p. 85, pl. 2. f. 3 (1855).
Terias fimbriata, Wallace, Trans. Ent. Soc. London, 3rd ser. iv. p. 323. n. 16 (1867).
Port Macquarie; Rockingham Bay; Port Essington; Silhet?; Hong-kong.
Probably a form of *T. hecabe*.

59. TERIAS HECABE.

Papilio hecabe, Linnæus, Syst. Nat. ii. p. 763. n. 96 (1766); Edwards, Glan. d'Hist. Nat. i. pl. 253.
Papilio hecube, Fabricius, Mant. Ins. p. 19. n. 201 (1787).
China; Silhet; Moulmein; Aru Islands; Port Essington; Rockingham Bay; N.W. Australia. B.M.

60. TERIAS HECABEOIDES.

Terias hecabeoides, Ménétriés, Cat. Mus. Petr. Lep. pl. 2. f. 2 (1855).
Nepaul (*Wright*). B.M.
I believe Nepaul to be the correct habitat of this species, which is scarcely distinct from *T. hecabe*.

61. TERIAS SILHETANA.

Terias silhetana, Wallace, Trans. Ent. Soc. London, 3, iv. p. 324. n. 17 (1867).
Id.? Assam and Borneo. B.M.
Probably a form of *T. hecabe*.

62. TERIAS DIVERSA.

Terias diversa, Wallace, Trans. Ent. Soc. 3, iv. p. 324. n. 20 (1867).
Id.? Philippines. B.M.

63. TERIAS SARI.

Terias sari, Horsfield, Cat. Lep. E. I. C. p. 136. n. 61 (1829).
Terias hecabe, var. ♀, Boisduval, Sp. Gén. Lép. i. p. 670 (1836).
Java. B.M.
Intermediate between *T. tilaha* and *T. hecabeoides*, Ménétr.

64. TERIAS TILAHA.

Terias tilaha, Horsfield, Cat. Lep. E. I. C. p. 136. n. 62 (1829).
Java. B.M.

65. TERIAS SINENSIS.

Terias sinensis, Lucas, Rev. Zool. p. 429 (1852).
China.
Near *T. tilaha*.

66. TERIAS EUMIDE.

Terias eumide, Felder, Reise Nov. Lep. ii. p. 214. n. 231 ("1865").
Celebes. B.M.

67. TERIAS ALITHA.

Terias alitha, Felder, Wien. ent. Mon. vi. p. 289. n. 51 (1862).
Ternate; Celebes. B.M.

68. TERIAS LORQUINII.

Terias lorquinii, Felder, Reise Nov. Lep. ii. p. 209. n. 222 ("1865").
Terias tilaha (part.), Vollenhoeven, Mon. Pier. p. 65 ("1865").
Celebes. B.M.

69. TERIAS ZITA.

Terias zita, Felder, Reise Nov. Lep. ii. p. 210. n. 223 ("1865").
Terias zama, Felder, *l. c.* n. 224 ("1865").
Menado.

70. TERIAS RAHEL.

♂. *Papilio rahel*, Fabricius, Mant. Ins. p. 22. n. 235 (1787).
Terias tondana, Felder, Nov. Voy. ii. pl. 26. f. 1 (1865).
♀. *Terias tominia*, Vollenhoven, Mon. Pier. p. 66. n. 3, pl. 7. f. 4 (1865).
Borneo. ♂, B.M.

71. TERIAS CELEBENSIS.

Terias celebensis, Wallace, Trans. Ent. Soc. 3, iv. p. 327. n. 32, pl. 6. f. 1 (1867).
Celebes. ♀, B.M.

72. TERIAS CANDIDA.

Papilio candida, Cramer, Pap. Exot. iv. pl. 331. f. A (1782).
Ceram. B.M.

73. TERIAS PUELLA.

Terias puella, Boisd. Voy. de l'Astrolabe, Ent. pl. 2. f. 8 (1833).
Terias virgo, Wallace, Trans. Ent. Soc. ser. 3, iv. p. 328. n. 35 (1867).
?*Papilio chrysopterus*, Gmelin, Syst. Nat. i. 5. p. 2261. n. 883 (1788–91); Zschach, Mus. Lesk. Ent. p. 88. n. 35 (1788).
Aru Islands. B.M.

74. TERIAS NEDA.

Pieris neda, Godart, Enc. Méth. ix. p. 135. n. 54 (1819).
♂. *Mancipium fugax Nise*, Hübner, Samml. ex. Schmett. i. pl. 146. f. 1, 2 (1806–27).
Terias tenella, Boisduval, Sp. Gén. Lép. i. p. 657. n. 6 (1836).
Pernambuco; Brazil; Honduras. B.M.

75. TERIAS ÆQUATORIALIS.

Terias æquatorialis, Felder, Wien. ent. Mon. v. p. 85. n. 46 (1861).
Bogota. B.M.
Nearly allied to *T. nise*.

76. TERIAS NISE.

Papilio nise, Cramer, Pap. Exot. i. pl. 20. f. K, L (1775).

Var. *Terias limbia*, Felder, Wien. ent. Mon. v. p. 86. n. 47 (1861).
Venezuela; Para. B.M.

Var. *Terias venusta*, Boisd. Sp. Gén. Lép. i. p. 658. n. 8 (1836).
Panamá. B.M.

77. TERIAS SOLANA.

Terias solana, Reakirt, Proc. Acad. Nat. Sci. Philad. p. 240. n. 6 (1866).
Mexico.
Allied to *T. nise*.

78. TERIAS NELPHE.

Terias nelphe, Felder, Verh. zool.-bot. Ges. Wien, p. 466. n. 3 (1869).
Mexico. B.M.
Allied to *T. neda*.

79. TERIAS SMILACINA.

Terias smilacina, Felder, Reise Nov. Lep. ii. p. 208. n. 220 (1865).
Venezuela. B.M.

80. TERIAS LEUCE.

Terias leuce, Boisduval, Sp. Gén. Lép. i. p. 659. n. 10 (1836).
Var. *Terias nisella*, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 474. n. 17 (1862).
Terias athalia, Felder, Reise Nov. Lep. ii. p. 208. n. 219 (1865).
Pernambuco. B.M.

81. TERIAS FLAVILLA.

Terias flavilla, Bates, Journ. Ent. i. p. 241. n. 4 (1861).
Bolivia. B.M.

82. TERIAS CICUMCINCTA.

Terias circumcincta, Bates, Journ. Ent. i. p. 241. n. 5 (1861).
Amazons.

83. TERIAS PAULINA.

Terias paulina, Bates, Journ. Entom. i. p. 240. n. 2 (1861).
St. Paulo. B.M.

84. TERIAS FLAVESCENS.

Terias flavescens, Chavannes, Bull. Soc. Vaud. iii. (1849).
St. Paulo.

Perhaps the same as the preceding. I cannot, however, get hold of the work in which it is described.

85. TERIAS PALLIDA.

Terias pallida, Chavannes, Bull. Soc. Vaud. iii. (1849).
St. Paulo.

I cannot determine this species, for the reason given above.

86. TERIAS MEMULUS.

Terias memulus, Butler, Proc. Zool. Soc. p. 251, Pl. XIX. f. 6 (1871).
Haiti. B.M.

87. TERIAS DEVA.

Terias deva, E. Doubleday, Gen. D. L. p. 78. n. 7 (1847).
Terias agave, Donovan (nec Fabricius), Nat. Rep. i. pl. 6. f. 2 (1823).
Terias fabricia, Poey, Mem. Hist. Nat. de Cuba, p. 252. n. 10 (1851).
Terias agavoides, Wallengren, Wien. ent. Mon. vii. p. 67. n. 33 (1863).
Brazil. B.M.

The above is certainly not the *P. agave* of Fabricius; for (as Donovan admits) that author describes the under surface of the apex of the wings as brown, a colour to which age has reduced the under surface of the figure in Cramer. Moreover he does not mention the discal series of red spots of *T. deva*, and he quotes Cramer's figure.

88. TERIAS RETICULATA, sp. n.

♂. *Alæ supra saturate flavæ; anticæ margine apicali-externo decrescente, undato, nigro; posticæ venis minutissime nigro-acuminatis; corpus virescens; anticæ subtus saturate flavæ; margine costali aureo-flavo; venis costalibus nigro distincte terminatis, costa basali nigro conspersa; venis marginis externi nigro acuminatis; margine ipso rufescente; posticæ aureo-*

flavæ, brunneo reticulatæ; maculis tribus griseis (prima basali, secunda costali, tertia internali), punctisque in arcu discali digestis vix conspicuis; corpus flavescens: exp. alar. unc. 2, lin. 4.

♀. *Differt alis posticis angustioribus; anticis ad basin aurantiacis; apice triangulariter nigrescente: exp. alar. unc. 2, lin. 3.*

♂, Archidona; ♀, Quito. Coll. B.M.

The most remarkable of all the species of *Terias*; it belongs to the *Deva* group, but reminds one of *Pyrisitia gundlachia* in the colouring of the under surface.

89. TERIAS CHILENSIS.

Terias chilensis, Blanchard, Gay's Faun. Chil. vii. p. 17, pl. 1. f. 5 *a*, *b* (1852).

Chili.

Allied to *T. deva*, but apparently quite distinct.

90. TERIAS CITRINA.

Terias citrina, Poey, Mem. Hist. Nat. de Cuba, p. 247. n. 6 pl. 18. f. 4–7 (1851).

Cuba.

Nearly allied to *T. dina*, but smaller; both sexes with markings on under surface.

91. TERIAS DINA.

Terias dina, Poey, Cent. Lep. de Cuba (1833).

Terias westwoodii, Lucas, Hist. Cuba, vii. p. 509, pl. 16. f. 2, 2^{a} (1856).

Terias laræ, Herrich-Schäffer, Corr.-Blatt. Regensb. xvi. p. 120 (1862).

Jamaica. B.M.

92. TERIAS WESTWOODII.

Terias westwoodii, Boisduval, Sp. Gén. Lép. i. p. 666. n. 22 (1836).

Terias dina, Hübner, Zutr. ex. Schmett. f. 951, 952 (1837).

West coast of Mexico. B.M.

93. TERIAS STYGMA.

Terias stygma, Boisduval, Sp. Gén. Lép. i. p. 661. n. 14 (1836).

Peru.

Belongs to the *Dina* group.

94. TERIAS HARINA.

♂. *Terias harina*, Horsfield, Cat. Lep. E. I. C. 137. n. 62 (1829).

♀. *Eurema formosa*, Hübner, Zütrage ex. Schm. f. 979, 980 (1837).

Java; Borneo; Amboina; Waigiou; Celebes; Assam; Silhet. B.M.

Genus 5. PYRISITIA, Butler,
Cist. Ent. iii. p. 44. gen. 17, pl. 1. f. 14 (1870).

1. PYRISITIA PROTERPIA.

Papilio proterpia, Fabricius, Syst. Ent. p. 473. n. 152 (1775).
Mexico; Haiti; Polochic valley; Venezuela. B.M.

2. PYRISITIA GUNDLACHIA.

Terias gundlachia, Poey, Mem. Hist. Nat. de Cuba, p. 246. n. 4, pl. 24. f. 1–3 (1851).
Nicaragua; Venezuela; West coast of Mexico. B.M.

3. PYRISITIA LONGICAUDA.

Terias longicauda, Bates, Ent. Mo. Mag. i. p. 32. n. 13 (1864).
Guatemala. Coll. Salvin.

6. Description of a New Species of *Tejus* (*Tejus rufescens*) from Mendoza. By Dr. A. GÜNTHER, F.Z.S.

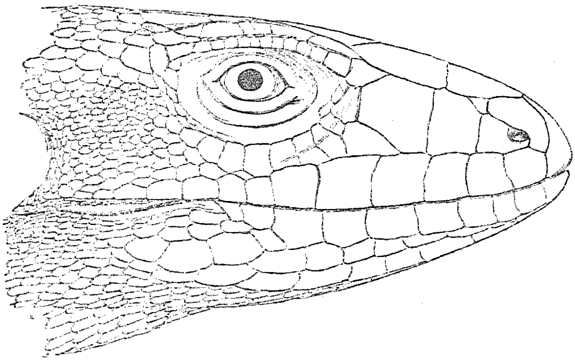
[Received May 17, 1871.]

The Society has recently purchased five living specimens of a *Tejus*, said to have been brought from Mendoza, which differ from the two species previously known in several respects.

With regard to the general form, proportions of the several parts, and arrangement of the scutes and scales, this Lizard agrees so well with *T. teguexin* and *T. nigropunctatus* that I may dispense with a detailed description, pointing out only those peculiarities in which it differs from the species named. I must remark that the pholidosis is the same in all the five Mendoza specimens which I examined.

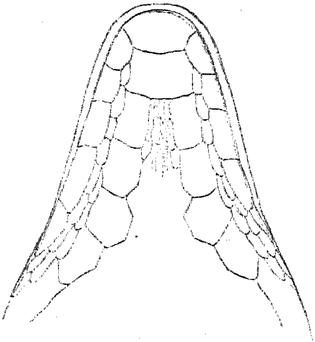
On all parts of the body the scales are considerably smaller than either in *T. teguexin* or *T. nigropunctatus*. This is especially conspicuous on the temple, where the scales are reduced to the size of granules. The number of transverse series of scales is about one-fifth more than in the other species. A stripe of minute scales between the supraciliary shields and supraciliary edge. A doublet series, each row formed by five larger scales, above the temple. Only one single mental shield behind the middle lower labial. Posterior part of the tail scarcely compressed, much less so than in *T. teguexin*. Blackish brown, with brownish-red or brownish-yellow markings. These markings are in the form of irregular transverse spots on the back, more distinct on the neck, but mottled with brown on the trunk and behind. An interrupted yellowish band proceeds from the tympanum along each side of the neck to the shoulder, where it is lost among the markings of the body. Tail with the alternate black and red rings rather indistinct. Lower parts brownish

Fig. 1.



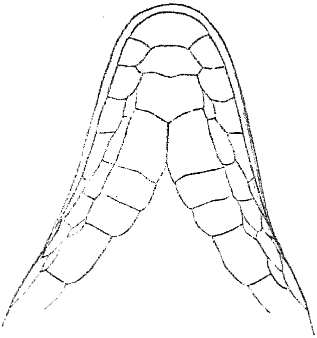
Tejus teguexin.

Fig. 4.



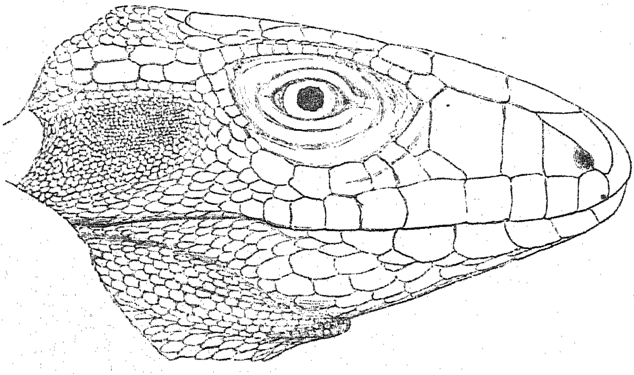
Tejus rufescens.

Fig. 2.



Tejus teguexin.

Fig. 3.



Tejus rufescens.

red, with irregular transverse blackish spots. Upperside of the limbs with small reddish specks.

In the largest specimen the reddish tinge covers nearly the whole body, whilst in two others of middle size it is confined to the markings and the lower parts. In two young specimens it is not developed, the markings being of a dirty whitish colour.

This species, for which I propose the name of *Tejus rufescens*, appears to grow to the same size as the two other species.

June 20, 1871.

R. Hudson, Esq., F.R.S., V.P., in the Chair.

The Secretary read the following Report on the additions to the Society's Menagerie during the month of May 1871:—

The total number of registered additions to the Society's Menagerie during the month of May was 181, of which 30 were by birth, 42 by presentation, 79 by purchase, 15 by exchange, and 15 were received on deposit. The total number of departures during the same period by death and removals was 114.

The following were the most remarkable additions during the month:—

1. Three specimens of a rather scarce and remarkable Water-Tortoise, *Sternothærus subniger* (*S. nigricans*, Dum. et Bibr. Erp. Gén. ii. p. 399), purchased May 3rd out of a vessel coming from Madagascar. We have already several specimens of a West-African species of the same genus, which I take to be *S. derbianus*, Gray, in the collection. The *Sternothæri*, I may remark, are very aquatic in their habits, keeping continually in the water, whereas the *Pelomedusæ* of the same family, at least in the case of our *P. gehafie*, seem never to enter the water.

2. A pair of the White-eared Fruit-bat of India (*Cynopterus marginatus*), purchased May 4th of Mr. Jamrach out of a collection of living animals brought home by him from Calcutta. This Fruit-bat is at once recognizable in life by the conspicuous white edging of the ears, and the white lines on the bones of the wings. It has not, I believe, been previously brought alive to Europe.

3. Two Marmots (*Arctomys*), also purchased of Mr. Jamrach at the same date. These animals are said to have been brought down to Calcutta by the Bhotanese, who conveyed a large number of Tragopans (*Ceriornis melanocephala*) from the same district of the Himalayas. They appear to be referable to *A. bobac*, the Siberian Marmot, and are quite new to the Society's collection*.

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* See Dr. Anderson's notes on the two Himalayan Marmots, *infrà*, p. 559 *et seq.*

4. A Lory, apparently of a new species, which I have already described at the last Meeting of the Society as *Lorius tibialis* *.

5. A rare Lorikeet, believed to be referable to *Trichoglossus mitchelli*, G. R. Gray *.

6. Three Crowned Partridges (*Rollulus coronatus*) from Malacca.

7. Four Black-throated Hill-Partridges (*Arboricola torqueola*) from the Himalayas.

8. A Long-billed Francolin (*Rhizothera longirostris*) from Malacca.

All these birds were purchased of Mr. Jamrach, along with the Mammals above mentioned, and belong to species new to the Society's collection.

9. A Galago, purchased May 5th, and said to have been brought from Port Natal, appears to agree nearly with the specimen described and figured by Mr. Bartlett (P. Z. S. 1863, p. 231, pl. xxviii.) as *Galago monteiri*. After examining this second specimen, I am inclined to think I was wrong in stating (P. Z. S. 1864, p. 712) that this Galago might turn out to be a pale variety of *G. crassicaudata*. Besides the difference in the colour of the fur, it is certainly smaller than that species, and has a much thinner and less densely furred tail.

10. A young male Chimpanzee (*Troglodytes niger*), brought home for us on his return from Africa and presented by Mr. J. J. Monteiro, C.M.Z.S., who has kindly given me some particulars concerning it, as follows:—

"The Chimpanzee was purchased from the blacks at Poanana, at the mouth of the river Congo; but as no inquiry had been made of the natives as to its exact place of capture, I am unable to give it to you. But this Monkey inhabits very plentifully the north bank of the Congo, whereas it is quite unknown south of that river.

"The manner in which this stream cuts off completely many species of animals, birds, insects, and plants, abundant north of it, and in its immediate vicinity, is most extraordinary and difficult of explanation, and would be perhaps an interesting subject for a naturalist to investigate on the south-west coast of Africa.

"The common Grey Parrot, found in thousands on the banks of the Congo, and northwards in Cabinda, Loando, &c., is *totally absent* south, even at a few miles from the river; and I only know of its existence at Cassange, perhaps 300 miles to the interior of Loanda, whence the traders and caravans often bring fine live specimens of the 'King Parrot,' with red feathers distributed amongst its grey plumage."

11. A Land-Tortoise of the genus *Cinixys*, also presented by Mr. Monteiro. This specimen appears to agree in every respect with specimens of *Cinixys belliana* in the British Museum, except in having a divided caudal plate. The entire caudal plate is a generic character of the genus *Cinixys*; so I consider this difference to be probably due to individual variation.

Mr. Monteiro has favoured me with the following notes on this Tortoise:—

"The Tortoise is from a granite range of low hills, coming down to the coast at Musserra (in about 7° S. lat.), and on one of which stands, as a prominent landmark, the 'remarkable granite pillar' of the charts of that coast. I only know this Tortoise elsewhere in the Benguella country, in 13° S. lat., in gneiss, and on a similar barren, very rocky ground. It only makes its appearance in the hot or rainy season, from October to May, and is said by the natives to hide deep in the ground during the cool season, or rest of the year."

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* See above, p. 499.

12. A young Lemur, born in the Society's gardens on the 7th of May. Its mother was one of the so-called Black-fronted Lemurs (*Lemur nigrifrons*, Geoffr.); and its male parent must have been one of our Red-cheeked Lemurs (*Lemur collaris*, Geoffr.), as there are no other male Lemurs in the same compartment of the Monkey-house. Moreover, as already stated in my notes on this subject (*anteà*, p. 231), the parents were evidently paired together. The little animal (which died the same day, and the skin of which I now exhibit) is certainly most like the female parent, though a *male*, and does not, so far, tend materially to confirm my theory of these two supposed different species being really opposite sexes of *Lemur mongoz*, although I have no doubt that this is correct.

13. A young male of the peculiar Bovine type of the island of Celebes, the Anoa (*Anoa depressicornis*), obtained by purchase of the Zoological Gardens of Rotterdam on the 10th of May, and being the first specimen of this animal exhibited in the Society's collection.

14. A young Eagle from the port of Fow-Chow in China, purchased May 11. This bird is in the striated plumage represented in Gray's 'Indian Zoology,' ii. pl. 28, which has been usually attributed to *A. imperialis*, but which Mr. Howard Saunders, in his recent remarks on this subject (P. Z. S. 1871, p. 38), believed to be the young of some allied species. In order to assist in the solution of this vexed problem, I have had a sketch made of our bird in its present plumage. This I now exhibit. We shall see what the bird turns into when it becomes adult.

15. A selection from a second collection of animals brought from Santiago, Chili, by Mr. Weisshaupt, under the same arrangements as those mentioned in the case of the similar collection received in July last year*. The selection consisted of the following animals, acquired at a total cost of £136:—

1 Long-haired Armadillo, *Dasypus vellerosus*, from Mendoza.
4 Buenos-Ayres Cow-birds, *Molothrus bonariensis*, from Mendoza.
2 Chopi Starlings, *Aphobus chopi*, from Chili.
2 Long-winged Milvagos, *Milvago megalopterus*, from Chili.
2 Chilian Swans, *Cygnus coscoroba*, from Chili.
2 Andean Geese, *Bernicla melanoptera*, from Chili.
2 Dominican Gulls, *Larus dominicanus*, from Chili.
5 Rufescent Teguexins, *Teius rufescens*, sp. nov., from Mendoza.

Of these the *Dasypus vellerosus*, *Bernicla melanoptera*, *Milvago*

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* See P. Z. S. 1870, p. 664.

megalopterus, and *Teius rufescens* (described by Dr. Günther, *suprà*, p. 541) are species new to the Society's collection.

The Armadillo is of special interest as confirming a species established by Dr. Gray in this Society's 'Proceedings' for 1865[*], upon a single specimen obtained by Mr. Bridges in "Bolivia." I have examined the typical example in the British Museum, and have no doubt of our specimen being identical with it, though in our rather larger individual the hairs are still longer. It is possible the locality ("Bolivia") assigned to Mr. Bridges's specimen may be correct; but I am somewhat inclined to doubt it. In a collection of birdskins made by Mr. Weisshaupt in the district of Mendoza, and between San Juan and San Luis, in the Argentine Republic, during the same expedition as that in which he obtained *Dasypus vellerosus* and the other animals, I have recognized several well-marked species, such as *Drymornis bridgesi* (Eyton), which are also commonly attributed to "Bolivia," but which were in all probability obtained by Mr. Bridges during his travels in the vicinity of Mendoza.

16. A Tamandua Ant-eater (*Tamandua tetradactyla*, Linn.) from the vicinity of Santa Marta, purchased May 29. The clever drawing of Mr. Keuleman's, which I exhibit (Plate XLIII.), will serve to give an idea of the external form of this animal, which has never been previously received alive by the Society, though we have at present two fine examples of *Myrmecophaga gigantea* living in the Menagerie, and have twice received living specimens of *Cycloturus didactylus*[†]. Our Tamandua measures as follows:—Long. corp. 20, caudæ 20, tota 40 poll. Angl.

17. Two examples of the peculiar Short-winged Rail of Lord Howe's Island, which I have lately described in this Society's 'Proceedings' an *Ocydromus sylvestris* (P. Z. S. 1869, p. 472, pl. xxxv.). For our specimens of this singular bird, as for so many rarities previously received, we have to thank our excellent friend and correspondent Dr. George Bennett, F.Z.S., of Sydney, N.S.W., and the authorities of the Botanic Gardens of that city.

Prof. Newton exhibited a series of eggs collected by the German North-Pole Expedition, and transmitted to him by Dr. Finsch. The most interesting among them were presumed to belong to *Calidris arenaria*, partly from the fact that no other species was observed by the Expedition to which they could possibly be assigned, and partly from the fact that all of them agree in every essential character, and some of them precisely, with an authenticated specimen of the egg of this bird exhibited by Prof. Newton in January last, and figured in the Society's 'Proceedings' (P. Z. S. 1871, p. 56, pl. iv. fig. 2). This he then believed to be the first genuine egg of the Sanderling which had been seen in England; but an examination of the present series shows that an egg which he obtained in Iceland in 1858, and also exhibited, must in all likelihood be attributed to the same species.

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[*] See P. Z. S. 1865, p. 376, pl. xviii.

[†] One of these Ant-eaters was "received on approval" from Mr. Colston, Sept. 16, 1854, the second "presented" by E. B. Webb, Esq., Sept. 5, 1858. The generic name is usually written *Cyclothurus*. Supposing the derivation of it to be κυκλωτὸς *rotundatus*, I prefer to write it *Cycloturus*.

Prof. Macdonald, of the University of St. Andrews, exhibited a series of specimens illustrative of the cranial bones of fishes.

An extract was read from a letter addressed to the Secretary by Mr. Walter J. Scott, C.M.Z.S., dated Valley of Lagoons, Queensland, March 16, 1871, stating that Mr. Haig, a planter on the Lower Herbert, had lately caught alive an apparently full-grown specimen of the Australian Cassowary (*Casuarius australis*), and was anxious to present it to the Society, if he could find an opportunity of sending it down to Sidney.

The following papers were read:—

1. On the Myology of the Limbs of the Kinkajou (*Cercoleptes caudivolvulus*) &c. By J. Beswick-Perrin. (Communicated by Professor Flower, F.R.S., V.P.Z.S.)

[Received June 19, 1871.]

I am indebted to Professor Flower for his kindness in allowing me the privilege of dissecting this interesting and beautiful animal, recently one of the inmates of the Society's Gardens.

To the description of the muscles of the Kinkajou I have added some remarks on the myology of the limbs of the *Paradoxurus typus* and Caracal (*Felis caracal*), more particularly mentioning the chief points of difference between them.

The *sterno-mastoid* consists of two portions, an anterior and external, and a posterior and internal.

The *former* is smaller than the latter. It arises from the apex of the manubrium sterni, being overlapped at its origin by the anterior fibres of the pectoralis anticus muscle; opposite the middle of the neck it divides into two nearly equal-sized slips; the outer of the two is inserted fascial into the occiput; the inner one joins the outer side of the deeper division to be inserted along with it into the mastoid process of the temporal bone. The posterior or internal portion is half as large again as the preceding; it arises from the summit of the manubrium along with its fellow of the opposite side. It is inserted with the inner division of the preceding into the mastoid process of the temporal bone. In the *Paradoxurus* the sterno-mastoid is a single muscle; it is inserted into both the mastoid of the temporal and the occipital bones. In the Dog it is a single muscle at its origin, bifurcating into two near its distal extremity, one to be inserted into the digastric groove, the other into the lateral part of the os occipitis (Douglas).

The *levator claviculæ* is a long, slender, and entirely muscular slip, which arises from the bottom of the digastric groove, external to the digastric muscle. It passes almost directly backwards towards the shoulder, to be inserted into the rudimentary clavicle, behind the levator humeri, with which it is closely associated. In the *Paradoxurus* it has the same arrangement, except that it is situated at its origin a little internal and posterior to the digastric muscle. The clavicle in this animal is represented simply by a tendinous intersection in the levator humeri.

In the Dog it is described by Douglas as the musculus ad levatorem accessorius.

The *levator scapulæ* arises from the anterior aspect of the broad, expanded, and wing-like transverse process of the atlas. It is inserted into the spine of the scapula near its anterior extremity. In the *Paradoxurus* the atloid attachment is not so decidedly in front of the transverse process, being more to its lower and outer border. At its insertion it is continuous with the anterior scapular fibres of insertion of the trapezius muscle. This muscle is the levator scapulæ major vel anterior of Douglas*.

The *levator scapulæ minor* is a detached segment of the levator anguli scapulæ. It arises from the lower border of the transverse process of the atlas, and is inserted into the dorsal extremity of the spine of the scapula. This muscle is wanting in the *Paradoxurus*. The slip which corresponds to it is blended with the levator anguli scapulæ. It presents the latter arrangement in the Dog.

The *occipito-scapular* occupies the rhomboid plane, and is very closely connected with the anterior border of the rhomboid muscle during its whole length. There is certainly a slight indication of an areolar interval; but the separation of this muscle from the rhomboid is arbitrary. In the *Paradoxurus* there is not the slightest trace of an areolar interval between the two. In the Kinkajou it arises from the occipital ridge external to the protuberance. The rhomboid is a continuation from the posterior border of this muscle downwards as far as the fourth dorsal spine. The occipito-scapular is inserted into the superior angle of the scapula, close to the base of the spine, and slightly in advance of the rhomboid muscle. The rhomboid extends from the preceding to the posterior inferior angle of the scapula. In the *Paradoxurus* the rhomboid does not extend along the neck beyond a point corresponding to the middle of its entire length.

The *omo-hyoid* arises from the superior angle of the scapula, lying between the supraspinatus and the subscapularis. It is inserted into the hyoid bone. In the *Paradoxurus* and Dog it is wanting.

The *levator humeri proprius* arises fleshy from the masto-occipital ridge and the posterior cervical raphe as low down as the second cervical vertebra. The origin of this muscle is inseparably connected with the trapezius at its lower part. It is inserted into the delto-pectoral tubercle, where it blends with the lower fibres of insertion of the anterior pectoral muscle. The trapezius presents a remarkable arrangement, the muscles of the two sides being directly continuous by means of a thin aponeurotic expansion across the dorsal mesial line, having no spinal attachments. The object of this arrangement is no doubt to facilitate the rapid approximation of the scapulæ, *e. g.* when the animal tears its prey.

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* Myographia Comparata.

This muscle is inserted into the anterior three-fourths of the scapular spine.

Besides there is an additional portion segmented from the preceding, which arises from the spines of the dorsal vertebræ from the second to the tenth inclusive. It crosses the inferior half of the vertebral border of the scapula and the adjacent portion of the infraspinatus, to be inserted into the lower and posterior half of the spine of the scapula.

The *serratus magnus* and *levator anguli scapulæ* constitute one large and continuous muscle. It arises, by fourteen digitations, from the transverse processes of the six lower cervical vertebræ, and from the nine upper ribs. The digitations are arranged in a radiate manner, advancing towards the middle line from the first to the sixth ribs, and then recedes to the ninth. Those attached to the six upper ribs extend as far as the anterior extremities of the vertebral ribs, springing from their upper margins; the three succeeding digitations do not advance so far forwards, and fit into corresponding processes from the external oblique muscle of the abdomen. Between the digitations attached to the second and third and third and fourth ribs pass the two superior muscular slips of insertion of the scalenus posticus.

The insertion of the serratus magnus does not present that twisted appearance common to the Primates; but it is simply flattened and extends the whole length of the vertebral border of the scapula.

In the *Paradoxurus* there is a similar arrangement, except that the levator anguli scapulæ representative is attached to all the cervical transverse processes; the upper and anterior one, no doubt, representing that which I have described in the Kinkajou as the levator scapulæ minor.

The *pectoral muscles* are three in number, viz. an anterior, a posterior superior, and a posterior inferior.

The *anterior* of these three pectoral muscles corresponds to the pectoralis major. It is elongated and irregularly quadrilateral in shape, and entirely muscular. It is attached proximally to the anterior half of the sternum and to the sternal extremities of the second to the seventh ribs inclusive. The most anterior fibres overlap, and are closely associated with the fibres of origin of the sterno-mastoid muscle. It is attached by its distal fibres to the upper half of the anterior border of the shaft of the humerus, extending from the great tuberosity to the distal end of the delto-pectoral ridge. It is partly blended with the fibres of insertion of the levator humeri.

The *posterior superior muscle* is situated behind the preceding. It is attached to the second, third, fourth, fifth, sixth, and seventh ribs close to the sternum, and also to the adjoining margin of the sternum. The muscular fibres converge as they pass outwards, finally terminating in a fascial expansion on the tuberosity of the humerus, into which it is implanted. It also sends off a fascial process which blends partly with the capsular ligament of the shoulder-joint, reaching as far upwards and forwards as the rudimentary coracoid process. This muscle closely accords with the second pectoral of birds in attaining to the position of an elevator humeri.

The *posterior inferior muscle* arises from the seventh, eighth, ninth, and tenth ribs, from the lower third of the mesosternum, and slightly from the xiphisternum. Its upper part is overlapped by the preceding muscles, while its lower portion appears on the same plane as the anterior pectoral. Its fibres are directed obliquely forwards and outwards, to be inserted into the middle of the inner margin of the delto-pectoral ridge. This muscle is joined at its insertion by a very large *Achselbogen* from the latissimus dorsi.

In the *Paradoxurus typus* and Caracal there is a similar arrangement of the pectoral muscles, except that the posterior inferior portion in the latter animal has a much more extended attachment to the radial border of the humerus by means of an aponeurotic tendon.

The *epigastric* muscle consists of two or three isolated bands of the panniculus carnosus, which spring from the antero-lateral aspect of the thoracic subtegumental fascia; these unite together at their anterior and outer extremity, forming a moderately strong muscle, which passes through the axillary cavity, joining the upper border of the Achselbogen close to its insertion into the humerus.

The *epicostalis* arises from the third, fourth, and fifth ribs, close to the sternum. It passes in a direction obliquely upwards, forwards, and outwards, crossing superficial to the rectus abdominis muscle (which is prolonged as far forwards as the second and first ribs). It is inserted into the first rib directly in front of the outer half of the preceding muscle. This muscle has a similar arrangement in the *Paradoxurus typus* and Caracal.

The *subscapularis* in neither of these animals presented any notable peculiarities.

The *latissimus dorsi*, *teres major*, and the *dorso-lateral panniculus* constitute by their intimate distal association one large, extensive, and complex muscle. The latissimus dorsi occupies a central position between the three. The proximal attachments have the same disposition which is common to the majority of the higher animals. Distally, the latissimus dorsi divides into three portions—a superior, mesial, and inferior.

The *superior* constitutes the Achselbogen of the German authors. It is inserted into the delto-pectoral ridge behind the pectoral muscles, as already mentioned. This muscle crosses in front of the axillary vessels and nerves (exactly as it does in the human subject when present), and is joined prior to its insertion by a contributory slip from the dorsal panniculus.

The *mesial* portion blends with the teres major, the two being inserted together into a depression internal to the delto-pectoral ridge.

The *inferior* portion is given off in conjunction with the preceding. It passes down the inner and posterior aspect of the arm as a strong wedge-shaped muscle, and is finally inserted into the anterior and inner border of the olecranon and fascia of the forearm. It receives about its middle a large slip from the dorsal portion of the panniculus. The latter muscle is also intimately associated with the teres major.

The *Paradoxurus typus* and Dog have a similar arrangement. In the Caracal the dorsal panniculus is not so differentiated as in the preceding, and the Achselbogen is wanting.

The *triceps* is large and exceedingly well-developed; the only point of note is that the representative of the anconeus is not segmented from the inner factor of the triceps, though in other respects disposed in the usual manner.

The *anconeus epitrochlearis* is small in the Kinkajou and in the *Paradoxurus typus*; but in the Caracal it is larger and more elongated. It arises in the latter from the ridge above the internal humeral condyle in front of the epicondyloid foramen. It is only partly inserted into the anconeal process, the remainder of its fibres being continuous with the flexor carpi ulnaris. This muscle, in combination with the flexor carpi ulnaris, simulates on the inner side of the humerus the supinator longus on the outside.

The *deltoid* consists of the two factors the mesodeltoid and postdeltoid, separated by an areolar interval. They present no remarkable features worthy of description.

The *supraspinatus* and *infraspinatus* have the usual arrangement.

The *teres minor* is represented by an unsegmented portion of the infraspinatus.

The *biceps* arises by two heads—one the analogue of the so-called long head of human anatomy, and the other the short head. Both arise in conjunction from the base of the coracoid tubercle. The long head is very large; it passes through the capsular ligament of the shoulder-joint, grooving the humerus. The short head consists of a narrow elongated tendon, which occupies almost half of the entire length of the muscle; it runs parallel with the long factor (after the latter has emerged from the bicipital canal) for some distance, then, passing in front of it, terminates at its distal extremity by blending with the anterior fibres of the long head. It is inserted into the radial tubercle. The short factor of the biceps gives origin to two varieties of the coraco-brachialis, viz. the short and the long. The coraco-brachialis brevis is an inverted-wedge-shaped muscle; it is inserted into the inner border of the neck of the humerus immediately above and extending somewhat behind the tendon of insertion of the teres major. The coraco-brachialis longus is a slender, elongated, wedge-shaped muscle; it arises from the tendon of the short head of the biceps, about half an inch below the preceding. The muscular fibres gradually taper into a tendon which occupies half the length of the entire muscle. It is inserted into the inner border of the humerus, immediately above the epicondyloid foramen.

This is a remarkable example of the coexistence of the long and short varieties of the coraco-brachialis of Wood. The latter accurate observer has placed on record several similar examples occurring in the human subject. I have also found several similar specimens;

but in no instance have they exhibited so complete and isolated a character as in the Kinkajou.

In the Caracal, *Paradoxurus*, and Dog the short variety of the coraco-brachialis only is represented, the long variety being absent. In the three latter animals the so-called biceps is a monogastric muscle, the long head alone being present. In this respect the Kinkajou presents a remarkable difference from the Dog, the Caracal, and the *Paradoxurus typus*, exhibiting a much higher grade of muscular development, and approximating more closely to the Primates. As regards the insertion of the biceps in the Dog, it is not always confined to the radius. I found it inserted into both the radius and ulna in a mongrel specimen.

Brachialis anticus. This muscle is very large and fleshy. It arises from the delto-pectoral ridge and upper half of the shaft of the humerus below this ridge. It is inserted into the coronoid process of the ulna. It has a similar arrangement in the Caracal and *Paradoxurus typus*. In the Dog the brachialis anticus is sometimes represented by an exceedingly small muscle which arises from the anterior surface of the lower end of the shaft of the humerus, instead of the more extensive attachment usually ascribed to it.

The *pronator radii teres* is a monogastric muscle. It arises from the inner humeral condyle below the epicondyloid foramen. It is inserted into a rough impression on the outer surface of the shaft of the radius, and into the bone for some distance below this point. It has a more extensive radial attachment in the *Paradoxurus*.

Palmaris longus externus arises by a pointed tendinous process from the internal humeral condyle, and from the septum between it and the adjacent muscles. It is inserted into the anterior annular ligament and palmar fascia; the latter is very thin, but disposed as in the human subject.

Palmaris longus internus is a fusiform muscle. It arises from the fascia covering the flexor carpi ulnaris, by a pointed tendinous process, about three quarters of an inch below the internal humeral condyle. It is inserted into the anterior annular ligament close to the pisiform bone; it is also partly continuous into the flexor brevis minimi digiti. This muscle may be regarded as a differentiated portion of the flexor carpi ulnaris; it is entirely supplied by the ulnar nerve. In the Caracal and *Paradoxurus* there is only the usual palmaris longus.

The *flexor carpi radialis* and *flexor carpi ulnaris* are like the corresponding muscles in the human subject. The ulnar nerve and the recurrent ulnar artery pass between the two heads of the latter muscle.

The *flexor sublimis digitorum* arises musculo-tendinous from the internal humeral condyle, coronoid process, and their connecting ligament. About half an inch below its origin it divides into a central and two flanking muscles. The two latter terminate in short tendons, which are inserted into the front and lateral aspects (one on each side) of the flexor profundus digitorum tendon, opposite the wrist-joint. The mesial portion divides into four tendons: three of these are superficial; but the fourth occupies the posterior aspect of the muscle, and terminates in the profundus tendon opposite the same point, and situated between the tendons of insertion of the forementioned flanking muscles. The three superficial tendons pass beneath the anterior annular ligament, traverse the palmar aspect of the fore foot, and form the perforated tendons of the second, third, and fourth digits. The perforatus tendon of the fifth digit is formed by the flexor brevis minimi digiti, to be presently described. In the *Paradoxurus* there are two flanking slips only. The flexor minimi digiti longus gives an additional slip to the fourth digit, joining the flexor-perforatus tendon opposite the first phalanx.

The *flexor profundus digitorum* has the same origin as the flexor pollicis longus and profundus digitorum of the human subject combined. Immediately above the radio-ulnar carpal articulation this large and fleshy muscle terminates in a strong and flattened tendon, which divides, opposite the middle of the metacarpal shafts, into five tendons,—one, the smallest, to the pollex; the remainder to the respective digits, perforating the superficial flexor tendons. This muscle has associated with it four lumbricals, which are disposed as in the human subject. There is no representative of the coronoid origin of the flexor longus pollicis, so common in the human subject.

The *flexor minimi digiti longus*. This peculiar muscle arises from the pisiform bone and from the tendon of the palmaris longus internus. Its muscular belly is wedge-shaped, and terminates in a long, slender tendon, which splits to allow the perforans tendon of the fifth digit to pass to the terminal phalanx. It is inserted into the sides of the base of the second phalanx of the fifth digit. I have found the homologue of this muscle several times in the human subject; in one specimen it was especially remarkable, arising by two distinct heads—one from an aborted and entirely tendinous representative of an additional palmaris longus, the other from the tendon of the flexor carpi ulnaris. These two heads united together immediately above the wrist-joint to form one well-developed muscle, which finally joined to be inserted with the abductor minimi digiti. Professor Wood has recorded several similar specimens* under the name of abductor minimi digiti. This muscle is not, however, an abductor, but decidedly a flexor of the little digit, and finds its homologue in the perforatus flexor of the fifth digit in the Carnivores.

The *abdactor minimi digiti* arises from the pisiform bone. It is inserted into the base of the first phalanx and the inner sesamoid bone opposite the metacarpo-phalangeal articulation.

The *flexor brevis minimi digiti brevis* arises also from the pisiform bone and tendon of the flexor carpi ulnaris. It is inserted into the base of the first phalanx on its ulnar side, and into the sesamoid bone. Besides these muscles there is another one, which corresponds in position and attachment to the opponens. It arises tendinous from the unciform bone and from the tendon of the flexor carpi ulnaris, prolonged from the pisiform to the fourth metacarpal base; As it passes along the metacarpal bone it divides into two portions. They are inserted into their respective sesamoid bones at the base of the first phalanx of the fifth digit. There is a small sesamoid bone developed in the tendon of origin of the latter muscle.

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* "Variations in Human Myology," Royal Society's Proceedings, June 1868.

The muscles of the pollex are three in number:—

1. *Abductor pollicis*, which takes its origin from the radial sesamoid bone and the os trapezium. It is inserted into the radial side of the base of the first phalanx and its sesamoid bone.

2. The *opponens pollicis* arises from the trapezium. It is inserted into the distal part of the pollex metacarpal, and into the sesamoid bone on the radial side of the metacarpo-phalangeal articulation.

3. *Flexor brevis pollicis* consists of two portions: one arises from the trapezium, and is inserted into the sesamoid bone and base of first phalanx; the other arises from the trapezoid and os magnum, and is inserted into the ulnar side of the base of the pollex proximal phalanx without impinging on the sesamoid bone.

The *pronator quadratus* occupies almost the entire length between the two bones of the forearm.

The *interossei of the fore foot*. There are only two superficial palmar interossei. They arise together by a thin flat tendon from the os magnum. Directly after their origin they diverge from each other: the one on the radial side terminates at the base of the first phalanx of the second digit on its ulnar side; the other (or ulnar side one) goes to the radial side of the base of the first phalanx of the fifth digit: the first abducts the index digit from the pollex; the second adducts the fifth digit in the direction of the pollex. In the words of human myologists, both adduct towards a line drawn down the centre of either the third or fourth digit. The deep interossei are six in number: the first arises from the pollex and index metacarpal bases and shafts, the second and third from the interval between the second and third metacarpals; the fourth and fifth between the third and fourth, and the sixth between the fourth and fifth metacarpals. They are inserted as follows:—Each of the second, third, and fourth digits receives one on each side. There are two sesamoid bones in connexion with each metacarpo-phalangeal articulation; and these muscles are connected respectively with each of them, and thus prolonged to the sides and bases of the proximal phalanges.

The first, third, and fifth adduct the second, third, and fourth digits towards the pollex; the second, fourth, and sixth abduct them from the pollex. These muscles can scarcely be called interossei; they are situated in a great measure upon the metacarpals rather than between them. The superficial ones are altogether removed from contact with the metacarpals. A good name for the deep layer would be "bilateral flexors." Any two of these muscles acting conjointly would produce direct flexion of the first phalanx on to the metacarpal. This is probably their true use in the living subject.

The Extensors of the Fore Limb.

The *supinator longus*, the *extensor carpi radialis longior* and *brevior* are exactly the same as in the human subject. In the

Paradoxurus and Caracal the two latter muscles are blended together; the common tendon resulting from the combined muscle divides behind the extensor ossis metacarpi pollicis into two, to be inserted into the radial sides of the second and third metacarpals.

The Kinkajou has these muscles much better developed and more perfect than the *Paradoxurus* and Caracal, and more in accordance with that condition which is called the average one in the human subject. This is not exactly true, however; for while the Kinkajou's muscles illustrate a decided advance above that of the Caracal, *Paradoxurus*, Dog, and Cat, and simulates the corresponding muscles in the Primates, still the human subject leads, and exhibits in the complexity of arrangement occasionally found in these muscles a tendency towards a further grade of muscular development which is minus a homologue in any other living animal. Douglas, in his 'Myographia Comparata,' states that the supinator longus is wanting in the Dog: I can scarcely say that it is wanting; it is aborted; its muscular belly is decidedly present and joined with the extensor carpi radialis communis. In several specimens which I have carefully examined, I have detected indications of segmentation of the supinator longus from its companion muscle. This was especially marked in a thoroughbred Spaniel which I had the pleasure of dissecting during last winter.

The *extensores communis digitorum* and *carpi ulnaris* and the *supinator brevis* present the usual arrangement.

The *extensor minimi digiti* divides into three tendons, to be distributed to the third, fourth, and fifth toes, joining the tendons of the common extensor on their ulnar sides.

The *extensor ossis metacarpi pollicis* is a large fleshy muscle; it is inserted into the trapezium and pollex metacarpal base.

The *extensor indicis* divides into two tendons: the radial one is distributed to the pollex, and constitutes its only phalangeal extensor; the ulnar one joins the ulnar side of the common extensor tendon to the second digit, to be inserted along with it.

Muscles of the Hind Limb.

The *psoas parvus* arises fleshy from the front and sides of the three upper lumbar vertebræ, and from the disks between the first and second, and second and third. The tendon of insertion is broad and flat, and commences on the superficial aspect of the upper part of the muscle, the muscular fibres being prolonged upon the under surface of the tendon for nearly half its length. It is inserted into the ilio-pectineal eminence and brim of pelvis immediately posterior to the origin of the pectineus. It lies superficial to the quadratus lumborum and psoas magnus, simply separated from the latter by areolar tissue.

The *ilio-psoas*. The psoas magnus arises from the front and sides of the bodies of the three lower lumbar vertebræ and their disks by fleshy fibres, and from the sacral surface and the posterior half of the pubic border of the ilium, where it becomes continuous with the iliacus. The latter arises from the iliac surface of the bone as a small and entirely fleshy muscle; it joins the preceding. The conjoined muscle is inserted by a very short and strong tendon into the lesser trochanter of the femur.

The *sartorius* arises from the upper third of the acetabular border of the ilium. It is inserted into the inner side of the patella, and into the shaft of the tibia immediately below the tuberosity. The tendinous expansion at the knee-joint is united to the ligamentum patellæ, and, stretching across the antero-lateral aspect of the joint, forms a protective covering to it.

The *gracilis*, three *adductores*, and *pectineus* present no peculiarities, except that the former is a very extensive muscle, and the adductor magnus is entirely fleshy, the femoral artery passing through a muscular canal and not a tendinous one as in the human subject.

The *rectus* has only one tendon of origin. It is inserted into the patella. The latter is not developed in the tendon of the rectus, but rather in the tendon formed by the conjoined vasti and crureus. There is no subcrureus; the arrangement of the extensors of the leg presents no other peculiarities.

The *semimembranosus* arises from the ischial tuberosity by a flat tendon half an inch wide. It is inserted into a depression on the inner surface of the tibia, immediately below the tuberosity, passing behind the internal lateral ligament. Its tendon of insertion is about a quarter of an inch long, the rest of the muscle being fleshy.

The *semitendinosus* arises by two portions—one from the transverse processes of the third and fourth caudal vertebræ by a continuous tendinous process, and the other from the tuber ischii. These two heads unite about an inch and a quarter below their origin, forming a large muscle which is inserted into the middle of the inner surface of the shaft of the tibia. From the caudal origin, opposite its point of junction with the ischial factor, a long slender muscle is given off, which courses along the outer and posterior border of the gluteus maximus muscle as far as the lower end of the femur, into which it is inserted immediately above the external condyle. This is a very peculiar muscle; I have only once met with the homologue of this slip in the human subject, a moderately muscular female *æt.* nineteen. It had not, however, the disposition as described in the Kinkajou. It arose from the long factor of the biceps femoris, and joined the semitendinosus immediately above the internal femoral condyle.

The *biceps femoris* arises by two heads—one, the ischial, by a pointed tendon from the tuberosity, the other from the transverse process of the second caudal vertebra, immediately anterior to the caudal factor of the semitendinosus. The former constitutes a broad, expanded muscle, increasing in width as it passes downwards. It terminates in a broad, expanded tendon, which is inserted into the head of the fibula and into the fascia of the leg to the extent of an inch and a quarter below this point; the latter, or caudal factor of the biceps, runs parallel with the preceding, and terminates along with its lower fibres in the fascia of the leg, reaching as low down as within an inch of the ankle-joint.

There are no special peculiarities in the quadratus femoris, obturatores externus and internus, and gemelli. They present the same attachments and disposition as the corresponding muscles in man.

The *gluteus maximus* is a large, broad, and somewhat extensive muscle. It arises from the upper and posterior aspect of the iliac crest, from the sacral aponeurosis which covers the sacro-caudal muscles, and from the transverse processes of the third and fourth caudal vertebræ. It is inserted into the posterior aspect of the shaft of the femur, occupying fully its middle three-eighths. Its upper fibres only are tendinous at their insertion.

The *gluteus medius* arises from the upper two-thirds of the dorsal surface of the ilium, from the aponeurosis of the gluteus maximus, and also that separating it from the sacro-caudal muscles; it is more or less continuous with the pyriformis muscle, and inserted along with it into the great trochanter of the femur.

The *gluteus minimus* preserves its usual arrangement; the gemelli and obturator internus muscles seem to be differentiations from it.

The *tensor fasciæ femoris* is a fusiform muscle. It arises from the ilium (below the sartorius) by a pointed tendon; the muscle is about an inch and a quarter long, and terminates in the fascia of the thigh.

The capsular ligament of the hip-joint is very strong; the ligamentum teres only moderately so.

The *gastrocnemius* has a sesamoid bone developed on its outer head; it presents no decidedly interesting peculiarities.

The *soleus* is a single-headed muscle. It arises from the head of the fibula, and from the peroneal intermuscular septum. It is inserted into the os calcis along with the preceding.

The *plantaris* is a very large muscle. It arises from the outer femoral condyle, and is also attached to the sesamoid bone belonging to the outer head of the gastrocnemius. It terminates in a strong tendon which traverses the inner aspect of the os calcis, and, becoming expanded in the sole of the foot, forms the plantar fascia. It is closely associated in the sole of the foot with the flexor brevis digitorum.

In the Caracal, Dog, and *Paradoxurus* this muscle is not so large. In other respects it does not materially differ from that of the Kinkajou.

The *popliteus* muscle is very large and fleshy. The anterior tibial artery passes above its upper instead of below its lower border as in the human subject. Occasionally, however, this peculiar mode of distribution of the artery is met with in man; I met with one instance of it during the last winter session.

The *abductor minimi digiti* is aborted at the sixth metatarsal base, constituting Wood's abductor ossis metatarsi quinti.

The *flexor brevis digitorum pedis* is distributed only to the second, third, and fourth digits; each tendon, prior to its splitting for the passage of the perforans, is joined by a fleshy slip from the accessorius, given off from the latter opposite the point of junction of the long flexors with the accessorius. The perforatus tendon of the fifth digit is derived from a distinct wedge-shaped muscle, which springs from the fibular aspect of the conjoined long flexor tendon, simulating a lumbrical muscle. It terminates in a long slender tendon, which splits to allow of the passage of the perforans tendon, and is inserted into the sides of the base of the fifth metatarsal second phalanx.

The *flexor longus pollicis* is mainly distributed to the third, fourth, and fifth digits. It is, however, intimately blended with the tendon of the flexor longus digitorum; the latter is mainly distributed to the first, second, and third digits. Both flex all the digits. The lumbricals are four in number, and are disposed as in man.

The *abductor hallucis* arises from the scaphoid bone by a pointed tendon, and fleshy from a sesamoid bone situated below the entocuneiform bone. It is inserted fleshy into the tibial side of the base of the first hallux phalanx and its sesamoid bone.

The *flexor accessorius* is a large monogastric muscle. It arises from the outer side of the os calcis. It is implanted into the conjoined tendon of the flexor longus hallucis et digitorum, and prolonged as three fleshy slips to the tendons of the flexor brevis digitorum as already mentioned.

The *flexor brevis hallucis* arises from the entocuneiform bone and the sheath of the peronæus longus. It is inserted into the sesamoid bone on the fibular side of the hallux metatarso-phalangeal joint.

The *flexor brevis minimi digiti* is comparatively large and fleshy. It arises from the sesamoid bone covering the base of the fifth metatarsal bone. It is inserted into the fibular side of the base of the first phalanx of the fifth digit. It has a sesamoid bone developed in its tendon of insertion.

Obliquus tarsi. This is a small muscle, conoid in shape, which arises from the depression between the prominent tubercle of the internal cuneiform on the inside, and the scaphoid and external cuneiform bones on the outside. It also receives a few fibres of origin from the tendon of the tibialis posticus. It is inserted into the tibial side of the base of the hallux metatarsal bone. I have ventured to give the above name to this muscle; so far as I am aware (I may be mistaken) it has not been previously described. I found it also in the *Paradoxurus typus.* When I dissected the Caracal, I did not notice this muscle, although I have no doubt it will be found in that animal also.

The *tibialis anticus* has its usual origin. It is inserted into the base of the hallux metatarsal. In the *Paradoxurus* and Lynx it is inserted into the hallux metatarsal and entocuneiform bones.

The *extensores longus hallucis* and *digitorum* present no special peculiarities.

The *extensor brevis digitorum pedis* is like that in man.

The *tibialis posticus* is inserted into the scaphoid ecto- and entocuneiform bones.

The *peronæus longus* and *brevis* are disposed exactly as in man. There is, however, an additional muscle, the peronæus intermedius or quartus. It arises in conjunction with the peronæus brevis, having a distinct and well-developed muscular belly which terminates in a long, slender tendon, which, having traversed the outer dorsal aspect of the foot, is inserted into the base of the first phalanx of the fifth digit, previously joining the common extensor tendon.

This muscle has the same arrangement in the Dog, Caracal, and *Paradoxurus typus*. It is a muscle not unfrequently found in the human subject—seldom, however, in the complete form above described, but as a tendinous offset from the peronæus brevis, and usually described as the peronæus quinti.

The *interossei* present no essential differences from those described in the manus. The plantar are two in number, and arise from the sheath of the peronæus longus and ectocuneiform bone. The dorsal interossei are six in number, and arranged as in the hand.

2. Notes on some Rodents from Yarkand. By JOHN ANDERSON, M.D., F.L.S., F.Z.S., Curator of the Indian Museum, Calcutta.

[Received June 5, 1871.]

Having lately received examples of *Arctomys bobac*, *A. hemachalanus*, *Lagomys curzoniæ*, and *Lepus tibetanus* from the country travelled over by the late Expedition to Yarkand, under Mr. Forsyth, I propose to describe them and to record a few facts regarding them, as they are species of rather rare occurrence and not very well recognized.

Arctomys bobac was figured and redescribed in 1841 by Hodgson[*] as a new species, and named *A. himalayanus*. Two years afterwards he again described it, along with another form, *A. hemachalanus*, to which I shall presently refer, and spoke of the former as the *A. himalayanus* of his Catalogue, but as "potius *tibetanus* hodie." In this account he says, "I cannot doubt that the above two species are distinct." Horsfield[†] in 1851 correctly referred *A. himalayanus* to *A. bobac*, but, in a footnote, referred to Hodgson's second paper, and made that naturalist describe an *A. tibetanus* and *A. himalayanus* as distinct, which he had never done, these two terms having been applied by him to one form, and the other, *A. hemachalanus*, restricted to another species. Blyth, in his Catalogue of Mammalia[‡], includes these two species under *A. bobac*, and states that he could not discriminate them in the skins and skulls before him, which is not remarkable, as these all belonged to typical *A. bobac*. Adams[§], however, was aware of two forms, but separated *A. himalayanus* (*tibetanus*) from *A. bobac*; and Dr. Jerdon[‖] mentions that he is inclined to accept them, as Hodgson insisted on their distinction and because he had himself seen skins in Darjeeling which inclined him to consider *A. hemachalanus* a distinct species. Dr. Stoliczka*, in a footnote to a notice of *Lagomys curzoniæ*, Hodgs., gives it as his opinion that Blyth had good reason to unite Hodgson's *A. tibetanus* (*A. himalayanus*) and *A. hemachalanus* with *A. bobac*, but does not record the grounds of his belief. Blyth, however, had no materials to sanction the conclusion at which he arrived; and Dr. Stoliczka appears to have been in a somewhat similar position. Hodgson's description of the two species is, in fact, liable to mislead; for he apparently had never seen an adult of *A. hemachalanus*, a specimen of which before me, procured on the Yarkand Expedition, is 22 inches from the tip of the nose to the vent, while his largest individual measured only 13 inches. The species therefore appear to be nearly of one size; but their tails are very different. In *A. hemachalanus* the tail measures a little less than half the length of the body, while in *A. bobac* it is only one-fourth of the length of the body. There are other characters, however, by which these two forms are separable from each other; and these I shall now indicate by giving a detailed description of each.

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[*] Journ. As. Soc. x. p. 777 (cum fig.), *ibid.* xii. p. 409.

[†] Catalogue of Mamm. in India-House Museum, Lond. p. 164.

[‡] Cat. of Mamm. in Museum of As. Soc. Beng., p. 108.

[§] Proc. Zool. Soc. 1858, p. 528.

[‖] Mammals of India, p. 182.

ARCTOMYS BOBAC.

Arctomys bobac, Schreber, Säugeth. iv. p. 738.

Mus arctomys, Pallas, Glires, 98, t. 8.

Arctomys fulvus, Eversm. & Griffith, A. K. t. 118.

Arctomys himalayanus, Hodgs. Journ. As. Soc. Beng. x. p. 777 (cum fig.), xii. p. 409 (potius *tibetanus* hodie).

Arctomys caudatus, Jacquemont, Voy. dans l'Inde, Zool. p. 66.

Arctomys bobac, Gray, Cat. of Mamm. B. M. p. 148; Horsfield, Cat. of Mamm., Lond. p. 164; Blyth (in part.), Cat. Mamm. As. Soc. Mus. pp. 108, 109; Stoliczka, Journ. As. Soc. Beng. xxxiv. p. 111.

Arctomys tibetanus, "Hodgson," Adams, Proc. Zool. Soc. 1858, p. 521.

Twenty to twenty-four inches from tip of nose to vent; tail, exclusive of hair, nearly one-fourth of the length of the body, cylindrical, and bluff-pointed. Above subrufescent cat-grey †, washed with blackish brown on the back and sides and front of face; chin to vent and fore and hind limbs yellow, the latter inclined to rufous. Fur close, thick, adpressed, rather harsh, $1\frac{1}{8}$ inch to $1\frac{1}{4}$ inch long, trebly ringed on all the upper parts with dusky rufescent yellow and blackish brown, the latter most intense on the face, forehead, head, and back. Tail with a blackish-brown tip, $1\frac{1}{2}$ inch long; palm with nails $2\frac{1}{2}$, sole $3\frac{1}{2}$ inches. Sexes alike, of nearly equal size. "Molars 5.4: first above unicuspid and cylindrical in its body, and tuberculous on the crown; the rest double, low, flat, and rather hollow-crowned, but with a slight keel on the inner extremity, and a groove between two transverse ridges towards the cheek." (*Hodgson.*)

Hab. Yarkand. Three specimens of this species are from Yarkand, where they were obtained by the members of the Expedition that lately visited that country. As no heights are given on the notes attached to the specimens, I can say nothing about the elevation at which they were found. The specimens in this Museum, prior to the reception of these, were from Tibet and the north of Sikkim. The specimen from the former locality was presented by Mr. Hodgson, and the one from the latter was received alive in Calcutta. There is no evidence, however, that it was found in Sikkim; for it had in all probability been brought to Darjeeling for sale from the high and dry country to the north-east, in the way the Wah (*Ælurus fulgens*) is at the present day.

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* Journ. As. Soc. Bengal, xxxiv. p. 111.

† The individual from which this specimen was taken was killed in the month of September.

Hodgson, in his first description of the short-tailed Marmot, gives the Himalayah, Kachar (rarely), and the sandy plains of Tibet as its habitat; but in his contribution to our knowledge of the two species, published in 1843, restricts its distribution to Tibet, and gives the former localities, with the exception of the last-named, Tibet, as the habitat of his long-tailed species, *A. hemachalanus*, which, he states, is also found in the immediate neighbourhood of the snows in the Bhote pergannahs. From these facts it appears that at first he had given a wrong account of the distribution of *A. himalayanus* (potius *tibetanus* hodie), which he was enabled to rectify by his more enlarged experience and by the recognition of two distinct species with a Tibetan and Himalayan dispersion. Jerdon remarks that *A. bobac* crosses over the snowy Himalayas only for a short distance, but is found on the Indian side along the whole length of the range from Kashmir to Sikkim, though less abundantly than on the Tibet side, and never at a lower elevation than 12,000 feet, often up to 16,000 feet. Dr. Stoliczka observes that it ascends to 17,800 feet on the hill-slopes of Ladak, and that it constructs its very deep burrows mostly on the sides of the valleys near the bottom.

ARCTOMYS HEMACHALANUS.

Arctomys hemachalanus, Hodgs. Journ. As. Soc. Beng. xii. p. 410.

Arctomys bobac, Adams, Proc. Zool. Soc. 1858, p. 521; Blyth (in part.), Cat. Mamm. As. Soc. Mus. pp. 108, 109; Stoliczka, Journ. As. Soc. Beng. 1865, xxxiv. p. 111.

Length 22 inches from tip of nose to vent; tail 10½ inches, exclusively of the hair, nearly half the length of the body and head. Rufous ochreous*; tip of hairs above washed with black, which is most intense on the back from the occiput to the lumbar region; pale yellow on the shoulders, which have few, if any, black-tipped hairs, and also on the sides, which are nearly free from them. Chin, throat, belly, fore legs, and inside of front of lower limbs deep rusty red; the outside of thighs pale rufous yellow, with a few black-tipped hairs; greyish hairs around the lips; cheeks washed with blackish; a large deep-black spot on the upper surface of the nose; the rest of the front of the face rufous yellow. Tail black, washed more or less with yellowish grey, the last four inches black. The fur coarse, and nearly $2\frac{1}{2}$ inches in length, loose and not adpressed; the black tips are not very long, and the yellow shows through them as a rule, but there are patches where they wholly obscure it; the base of the hair generally is rather rufous dark brown, and is succeeded by a broad rufous-yellow band, followed by the apical black one. Palm, including nails, $2\frac{4}{12}$ inches; sole, including nails, $3\frac{10}{12}$ inches. The heel is more sparsely clad with hairs along its margin than is the tarsus of *A. bobac*.

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* The specimen from which this description was taken was killed on the 22nd of June.

The three specimens before me were obtained, one at Malayon on the Tibetan side of the Tooglen pass, the other two by purchase at Darjeeling. They all present the above characters, with little or no variation. The deep rufous colouring of the underparts, the long coarse and loose hair, combined with the greater number of the caudal vertebræ, separate this species from *A. bobac*. It is probably the Marmot observed by Hooker in the Lachen valley to the south of Kinchinghow. Adams designates his *A. bobac* as the red Marmot of Europeans, and states that it abounds in the valley of the Dras river, Ladak, Wurdaun Pass, Cashmere, and at elevations on the neighbouring ranges from 8000 to 10,000 feet above the sea.

LAGOMYS CURZONIÆ, Hodgs.

Lagomys curzoniæ, Hodgs. Journ. As. Soc. Beng. xxvi. p. 207, Ann. & Mag. Nat. Hist. 1858, p. 80; Stoliczka, Journ. As. Soc. Beng. xxxiv. p. 108.

Upper surface of body pale buff, tinged with rufous, the hairs tipped with brownish: sides slightly more rufescent; head markedly rufescent as far back as on a line with the ear. Ears rather large and oval, very obscurely pointed, clad internally with long fluffy rufous hair confined to the lower three-fourths of that surface; the posterior three-fourths of the ear externally and internally margined with pale fulvous buff; the inside clothed with fine, rather short, buff hairs; the lower internal margin with long pale yellowish-buff hairs. Sides of head and behind nose dirty white, tinged with fulvous. Shoulders in some adult females pronouncedly rufous buff. Under surface from chin to vent white, with a faint yellowish tinge, or mixed with slaty when the bluish base of the hairs shows through their whitish tips. Limbs externally and internally and soles of feet white, with a faint yellowish tinge. Whiskers mixed black and white. Nails and pads of feet black. Teeth pure white.

The fur is moderately long, very fine and silky, and consists of three kinds of hairs. The ordinary hairs which constitute the bulk of the fur, and which measure $\frac{11}{16}$ of an inch in length, have the basal $\frac{8}{16}$ of an inch dark slaty; and the remaining terminal portion, when isolated, is seen to be a pale yellow, with a narrow brownish tip. With age the brown ends are worn off; but in young specimens, and even in adolescents, they are invariably present. Intermixed with these hairs there are numerous fine, curly, almost woolly ones, with the same markings and length, but not so intensely coloured. The third kind is a long, fine, bristle-like hair, 1 inch in length, very numerous on the upper and under surfaces, but not so observable on the latter region, where they are pure white, whereas on the dorsum and sides they have either long black points or are wholly black. Length of largest specimen:—Tip of nose to vent $9\frac{12}{16}$ inches; nose to anterior angle of eye $\frac{12}{16}$ inch; posterior angle of eye to ear $\frac{14}{16}$ inch; greatest length of ear 1 inch, greatest breadth 1 inch; length of fore foot and nails $1\frac{9}{16}$ inch; length of hind foot and nails $1\frac{9}{16}$ inch.

The hair of this species, and of the members of the genus generally, becomes much worn by age. This is doubtless due to their habit of life, and not to any disease produced by insects*; for it is only observed, as a rule, on the parts exposed to friction, such as the lumbar region, rump, and sides, and is rarely, if ever, observable on the head or on the belly, and does not occur in the young, and only to a very slight degree in adolescents.

I have received no less than nine specimens of this species from Ladak, all procured in one month and within a few days of each other, but I cannot state at what elevation they were found. It is worthy of note that six are females, three of which are adults, two adolescents, and one young; while the three males are all of one size, about $7\frac{1}{2}$ inches long, but evidently not full-grown. The latter are paler fawn-coloured than the females of their own age, but slightly darker than the young female. There is altogether a greater intermixture of dark hairs in the adolescent females than in the males; and the hair on the back of the ears is more rufous in the former.

Dr. Stoliczka (*l. c.*) states that it ranges all over the eastern portion of Ladak from 14,500 up to 19,000 feet, the probable limit of vegetation in these parts, but notes that Hodgson's specimens were from the Chumbi valley to the north of Sikkim, which would indicate that its eastern distribution is considerable. Dr. Hooker mentions a tailless Rat in the Lachen valley to the north of Kinchinghow at 16,000 feet, associated with a Marmot; but, from the elevation mentioned it is probable that the species is *L. roylei*, which appears to be identical with *L. hodgsoni*, Blyth, and *L. nepalensis*, Hodgson. The type of Blyth's species is in this museum, and was afterwards correctly referred by him to *L. roylei*; and as specimens of *L. nepalensis*, presented by Hodgson, are also before me, I am enabled to state that it in no way differs from *L. roylei* beyond exhibiting the slight variations of colour which are to be looked for and occur in all species. *L. roylei* takes the place of *L. curzoniæ* at lower elevations than 16,000 feet, its usual distribution, according to Jerdon, being 11,000 to 14,000 feet; but it probably extends up to 16,000 feet. It occurs in Ladak, Kashmir, on the Chor mountain, not far from Simla, and extends to the east through the high northern ranges of Nepaul and Sikkim.

LEPUS TIBETANUS, Waterhouse.

Lepus tibetanus, Waterh. Proc. Zool. Soc. 1841, p. 7.
Lepus oïostolus, Hodgs. Journ. As. Soc. Beng. ix. p. 1186.

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* Stoliczka, *l. c.*

General colour of back anterior to sacral region, neck, and head pale fulvous buff, mottled with black and yellowish white, darker on the face and on the internal half of the posterior surface of the ear, the latter area being concolorous with the forehead; a rufous tint on the back of the neck; hind quarter pale ashy grey; tail white, with an ashy-grey line above; limbs and under surface of neck, shoulder, groin, front of fore legs, under surface of feet, and upper surface of hind feet rather rufous buff; chin, throat, chest, belly, external half of posterior surface of ear, and inside of legs pure white. The ear is longer than the head, $3\frac{14}{16}$ inches in length from base to tip, and about $1\frac{3}{4}$ inch in breadth; its internal surface is densely covered with yellowish hairs, and the lower half of its inner margin with long white, rufous-washed hairs, and is tipped with black at the apex. Whiskers black and white, or black with long white tips. Incisors white. Nails dusky at the base, with horny-coloured tips. Fur very fine and woolly, of moderate length and silky texture; it is about $1\frac{4}{16}$ inch in length; but there are numerous long hairs scattered through it measuring 2 inches long. The basal $\frac{9}{16}$ inch of the fur is slaty; and many of the hairs have a black tip to the broad buff band that succeeds the darker band. Many of the long hairs on the buff parts of the upper surface have long black tips, while others have broad yellowish-white subapical bands, which, along with the black tips, produce the mottled appearance of the fur. Length from nose to vent 14 inches; tail $2\frac{1}{2}$ inches.

Hab. Tibet. Four specimens.

A specimen of a Hare in this Museum, referred to *L. pallipes*, is essentially ochreous, as described by Waterhouse, and pencilled with black; and the base of the fur is white, instead of slaty as in *L. tibetanus*. The ears are coloured as in this species; but I cannot give their length, as the skin has not the skull in it and the head is much distorted. It appears to be a somewhat larger Hare than *L. tibetanus*, and is distinguishable by its rather rich ochreous coloration and black pencillated fur, which is white at its base instead of being slaty. Whether it is correctly referred to *L. pallipes* I do not say, as the specimen is in a very wretched state of preservation.

3. A Revised List of the Neotropical *Laridæ*. By P. L. Sclater, M.A., Ph.D., F.R.S., and Osbert Salvin, M.A., F.L.S., &c.

[Received May 26, 1871.]

Dr. Coues having lately published an excellent account of the North-American *Laridæ* in several papers in the 'Proceedings of the Academy of Natural Sciences of Philadelphia' *, we shall content ourselves in the present communication with giving a revised list of the species of this family which have been ascertained to occur within the limits of the Neotropical region, so far as we are acquainted with them*.

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* For the Gulls, see *op. cit.* 1862, p. 291; for the Terns, *ibid.* p. 535; and for the Skuas, *op. cit.* 1863, p. 121.

The Neotropical *Laridæ* may be divided into the following categories:—

(1) *Tropical* species, either not extending beyond the limits of the Neotropical region, or only into the southern part of the Nearctic region—such as *Phaëthusa magnirostris* and *Rhynchops nigra*.

(2) *Antarctic* species, found only in the southern part of the continent, or not ranging further north than Southern Brazil and Peru—such as *Lestris antarctica* and *Sterna cassinii*.

(3) *Arctic* species, which descend into the Central-American seas, or even further into the Neotropical region—such as *L. franklini*.

(4) *Tropicopolitan*, or wide-ranging species in the Tropical seas—as *Anous tenuirostris* and *Onychoprion fulginosus*.

The subjoined table shows the number of species of each genus referable to these categories:—

	Tropical.	Antarctic.	Arctic.	Tropicopolitan.	Total.
1. Rhynchops	1	...	...	...	1
2. Anous	...	...	...	2	2
3. Nænia	1	...	...	...	1
4. Phaëthusa	1	...	...	...	1
5. Sterna	6	1	3	...	10
6. Gelochelidon	...	...	1	...	1
7. Onychoprion	...	...	...	2	2
8. Hydrochelidon	...	...	1	...	1
9. Larus	6	1	4	...	11
10. Leucophæus	...	1	...	...	1
11. Lestris	...	1	...	...	1
	15	4	9	4	32

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* Since this paper was read Salvin has examined the specimens in the Imperial Cabinet at Vienna collected by Natterer in Brazil and determined by Von Pelzeln in his recently published 'Ornithologie Brasiliens.' According to our views the *Laridæ* of v. Pelzeln's work (Orn. Bras. p. 323) should stand as follows:—

Pelzeln. Scl. et Salv.
Larus azaræ = *L. dominicanus*.
Larus maculipennis. Natterer's specimens are all immature, and probably belong to *L. cirrhocephalus*.
Larus atricilla = *L. atricilla*.
Rhynchops nigra = *R. nigra*.
Sterna galericulata = *S. maxima*.
Sterna magnirostris = *Phaëthusa magnirostris*.
Sterna cayennensis = *S. galericulata*.
Sterna cantiaca = *S. cantiaca*.
Sterna argentea = *S. superciliaris*.
Sterna wilsoni = *S. cassini*.
Sterna aranea = *S. anglica*.

Subfam. I. RHYNCHOPINÆ.

Genus RHYNCHOPS.

1. RHYNCHOPS NIGRA, Linn.

Rhynchops nigra, Linn. S. N. i. p. 228; Licht. Doubl. p. 80; Baird, B. N. A. p. 866; Max. Beitr. iv. p. 877; Burm. Syst. Ueb. iii. p. 454, et La Plata, ii. p. 320; Léotaud, Ois. de Trin. p. 534; Pelz. Orn. Bras. p. 324; Ph. et Land. Cat. Av. Chil. p. 50; Gundl. Rep. F. N. i. p. 393; Salvin, Ibis, 1865, p. 193, et 1866, p. 200.

Rhynchops melanura et *R. borealis*, Swains. An. in Men. p. 340; Scl. et Salv. P. Z. S. 1866, p. 201, 1867, pp. 593, 754; Cab. in Schomb. Guian. iii. p. 761.

Rhynchops cinerascens et *R. brevirostris*, Spix (av. jr.).

Rayador, Azara, Apunt. iii. p. 329.

Hab. Coasts of America, from Cuba (*Gundlach*) down to 45° S. l. (*Darwin*); on the western coast of South America down to Concepcion (*Ph. et Landb.*); also ascends the larger rivers many hundreds of miles, Ucayali (*Bartlett*); Rio Napo (P. Z. S. 1858, p. 77); Matogrosso and Cajutuba (*Natt.*).

The southern bird is separated by Swainson as having the tail black; and we were at one time inclined to adopt this view, both Wallace's and Bartlett's Amazonian specimens presenting this feature, whereas Salvin's series from Central America have the lateral tail-feathers pure white, and a well-defined white collar behind. But one of Salvin's skins shows the lateral rectrices dark in the middle; and as his specimens were all shot in midwinter, it is possible that the tail of the northern bird may grow blacker in the summer plumage. At the same time, it is probable that northern and southern birds may be generally distinguished by the greater amount of white on the wings and tail of the former.

Subfam. II. STERNINÆ.

Genus 1. ANOUS, Leach.

1. ANOUS STOLIDUS.

Sterna stolida, Linn. S. N. i. p. 227; Less. Zool. Coq. i. p. 244: Max. Beitr. iv. p. 874; Burm. Syst. Ueb. iii. p. 453.

Anous stolidus, Baird, B. N. A. p. 865; Coues, Ibis, 1864, p. 392; Gundl. Rep. F. N. i. p. 393; Sund. Öfv. af K. V. A. F. 1869, p. 590.

Hab. Cuba (*Gundlach*); St. Bartholomew (*Sund.*); British Honduras (*Salvin*); coast of South-east Brazil (*Max.*); coast of Chili (*Lesson*).

2. ANOUS TENUIROSTRIS.

Sterna tenuirostris, Temm. Pl. Col. 202.

Anous melanogenys, Léotaud, Ois. de Trin. p. 547 (?).

Anous tenuirostris, Coues, Ibis, 1864, p. 393; Salv. Ibis, 1866, p. 200.

Hab. Coast of British Honduras (*Salvin*); Trinidad (*Léotaud*).

Genus 2. NÆNIA*, Boie.

1. NÆNIA INCA.

Sterna inca, Less. Zool. Voy. Coq. p. 731, t. 47 (1826).
Anous inca, Gray, Gen. iii. p. 661; Pelz. Orn. Novara-Reise, p. 156.
Nænia inca, Bp. C. R. xlii. p. 773.
Noddi inca, Gay, Cat. Aves Chil. p. 50.
Inca mystacalis, Jard. Contr. Orn. 1850, p. 32.
Larosterna inca, Blyth, Cat. Mus. As. Soc. p. 293 (1849).
Hab. Coast of Peru (*Less.*, *Tsch.*); coast of Chili (*Ph. et Landb.*).

Genus 3. PHAETHUSA, Wagler.

1. PHAETHUSA MAGNIROSTRIS.

Hati cabeza negra, Azara, Apunt. iii. p. 373.

Sterna magnirostris, Licht. Doubl. p. 81 (1823); Max. Beitr. iv. p. 861; Hartl. Ind. Azar. p. 26; Spix, Av. Bras. ii. p. 81, t. 104; Cab. in Schomb. Guian. iii. 761; Tsch. F. P. *Aves*, p. 305; Pelz. Orn. Bras. p. 324; Burm. Syst. Ueb. iii. p. 450, et La Plata-Reise, ii. p. 519; Scl. et Salv. P. Z. S. 1867, p. 593 et p. 979.

Hab. Guiana (*Schomb.*); Lower Amazon (*Wallace*); Upper Amazon, Pebas (*Hauxwell*); rivers Huallaga and Ucayali (*Bartlett*); S. E. Brazil (*Max. et Burm.*); Rio Parana (*Burm.*); Cuyaba (*Natt.*); Paraguay (*Azara*); coast of Peru (*Tsch.*).

Genus 4. STERNA, Linn.

1. STERNA MAXIMA.

La grande Hirondelle de Mer de Cayenne, Buff. Pl. Enl. 988.

Sterna maxima, Bodd.

Sterna cayennensis, Gm. S. N. i. p. 608; Léotaud, Ois. de Trin. p. 535.

Sterna cayana, Lath. Ind. Orn. ii. p. 804.

Thalasseus cayanus, Gosse, B. Jam. p. 431.

Sterna regia, Gamb. Proc. Ac. Nat. Sc. Phil. iv. 128; Baird, B. N. A. 859.

Thalasseus regius, Coues, Ibis, 1864, p. 388; Salvin, Ibis, 1866, p. 198; Gundl. Repert. F. N. i. p. 392.

Sterna erythrorhynchos, Max. Beitr. iv. 857; Tsch. F. P. *Aves*, p. 305; Burm. Syst. Ueb. iii. p. 450.

Hati cogote obscuro, Azara, Apunt. iii. p. 372 (?).

Sterna chloripoda, Vieill. N. D. xxxii. p. 171, et E. M. p. 349?

Hab. West Indies, Cuba (*Gundl.*); Jamaica (*Gosse*); S. Croix (*Newton*); Trinidad (*Léotaud*); Pacific and Atlantic coasts of Guatemala (*Salvin*); coast of Cayenne (*Buffon*); coast of Brazil (*Max. et Natt.*); Rio Paraná (*Azara*); coast of Peru (*Tsch.*).

Of this Tern Salvin has many specimens from the Guatemalan coast, which have been compared by Mr. Coues with types of *S. regia* of Gambel. We have also a series of skins of the same bird collected by Mr. Rogers on the coast of South Brazil. There can therefore be no question of its being found in the intermediate localities. As it appears to agree better than any other species with Buffon's *Grande Hirondelle de Mer de Cayenne* (Hist. Nat. ix. p. 219; Pl. Enl. 988), we adopt Boddaert's name *Sterna maxima*, as the first applicable to the bird. The only other large Tern to which Buffon's description and plate could possibly be referable is *Sterna galericulata*. But the bill of Buffon's figure is much more nearly like the stout bill of Gambel's *S. regia* than the slender incurved bill of *S. galericulata*.

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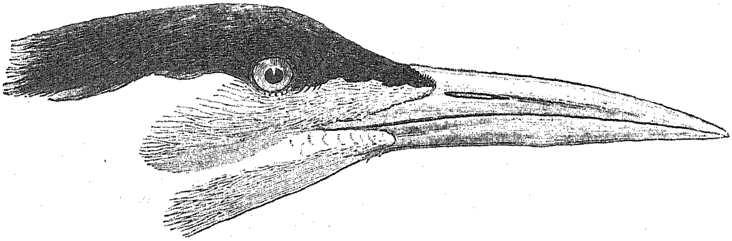
* Boie, Isis, 1849, p. 189, = *Larosterna*, Blyth, Cat. Mus. As. Soc. Calcutta, p. 293 (1849), = *Inca*, Jardine, Contr. Orn. 1850, p. 32.

Fig. 1.



Head of *Sterna maxima* (reduced one-third).

S. erythrorhynchos of P. Max. and Burmeister seems to be founded on Brazilian specimens of this species.

S. maxima is at once distinguishable from all other Neotropical Terns by its large size and strong straight bill (see fig. 1), which is upwards of 2½ inches in length from the front. Its wing measures from 14 to 15·5 inches. *S. galericulata*, which comes next to it in size (wing 11·5 to 12 inches), has the bill equally long, but much more slender and incurved (see fig. 2, p. 569). In the adult *S. galericulata* the under plumage has a rosy tinge, which we have never seen in skins of the present species.

2. STERNA GALERICULATA.

Sterna galericulata, Licht. Doubl. p. 81; Schlegel, Mus. des P.-B. *Sternæ*, p. 7.

Sterna elegans, Gamb. Pr. Ac. Nat. Sc. Phil. iv. 129; Baird, B. N. A. 860, pl. 94; Léotaud, Ois. de Trin. p. 542.

Thalasseus elegans, Coues, Ibis, 1864, p. 389; Salvin, Ibis, 1866, p. 198.

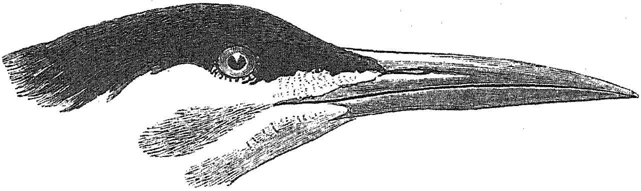
Sterna comata, Ph. et Landb. Wiegm. Arch. 1863, pt. 1, p. 126.

Hab. Tehuantepec (*Sumichrast*); Pacific coast of Honduras (*Dow*); Trinidad (*Léotaud*); Brazilian coast (*Licht.*); Arica, Peru (*Frobeen*).

Of this species Salvin has one specimen in winter plumage, shot by Capt. Dow in the Bay of Fonseca (which has been compared by Dr. Coues with the type of *S. elegans*), and a second specimen in full breeding-plumage from Tehuantepec. Two skins obtained by

Rogers on the coast of Southern Brazil offer no differences on comparison; and we are therefore induced to follow Prof. Schlegel in uniting *S. elegans* to *S. galericulata* of Lichtenstein, obtained from the latter locality. It may be observed that Lichtenstein's description of *S. galericulata* is nearly as well applicable to *S. maxima*; but as Prof. Schlegel has had the advantage of examining one of Lichtenstein's typical specimens, we cannot doubt that he is correct in making it identical with *S. elegans* of Gambel (*S. maxima* being =*S. regia*, Gambel).

Fig. 2.



Head of *Sterna galericulata* (reduced one-third).

On reading Messrs. Philippi and Landbeck's description of their *Sterna comata*, we find it in every way applicable to the present species, which might be naturally expected to extend down the western coast, as it does down the eastern coast of South America.

As already mentioned, the chief peculiarity of this species is its long, slender, slightly incurved bill.

3. Sterna cantiaca.

Sterna cantiaca, Gm. S. N. i. p. 606; Schlegel, Mus. des P.-B. *Sternæ*, p. 5.

Sterna acuflavida, Cabot, Proc. Bost. Soc. N. H. iii. 257; Baird, B. N. A. 860.

Thalasseus acuflavidus, Coues, Pr. Acad. Phil. 1862, p. 540, et Ibis, 1864, p. 389; Salvin, Ibis, 1866, p. 198; Gundl. Rep. F. N. i. p. 392.

Hab. Coast of Cuba (*Gundlach*); Atlantic coast of British Honduras, and Pacific coast of Guatemala (*Salvin*).

We fail to appreciate the distinctions attempted to be drawn between this species and its European representative. Dr. Coues has ably discussed the subject, and has succeeded in reducing the differences between them to a minimum which is too small to warrant specific separation.

This is a northern species, and only appears to occur in the northern part of the Neotropical region. Salvin found it breeding on the coast of Belize in the month of May.

4. Sterna forsteri.

Sterna hirundo, Sw. et Rich. F. B.-A. ii. p. 412.

Sterna forsteri, Nutt. Man. ii. 274 (note); Baird, B. N. A. 862;

Coues, Proc. Ac. Phil. 1862, p. 544, et Ibis, 1864, p. 390; Salvin, Ibis, 1866, p. 199.

Sterna chloripoda, Léotaud, Ois. de Trin. p. 537?

Hab. Lake of Dueñas, Guatemala (*Salvin*); coast of Brazil (*Mus. S.-G.*).

Salvin obtained one specimen of this Tern in winter plumage on the Lake of Dueñas in October 1862, which has been examined by Dr. Coues. But it seems to go occasionally much further south, as Salvin and Godman's collection contains a skin, apparently of this species, taken at sea 300 miles off Pernambuco.

5. STERNA TRUDEAUII*.

Sterna trudeauii, Aud. Orn. Biogr. v. p. 125; Baird, B. N. A. p. 861; Coues, Pr. Ac. Sc. Phil. 1862, p. 542; Schlegel, Mus. des P.-B. *Sternæ*, p. 29.

Sterna frobeeni, Ph. et Landb. Wiegm. Arch. 1863, p. 125, et Cat. Av. Chil. p. 49.

Hab. Coast of Brazil (*Rogers*); coast of Chili (*Leybold*).

Mr. Rogers has lately sent a series of skins of a Tern from the coast of Southern Brazil, which appear to answer very fairly to *S. trudeauii* of Audubon, as redescribed by Dr. Coues from Audubon's type. Prof. Schlegel likewise recognizes the species in skins coming from the same locality. Like Audubon's and Prof. Schlegel's specimens, Mr. Rogers's eight skins are all white-headed, with a black transocular blotch. This would give one the idea of a Tern in winter dress; but we are inclined to agree with Prof. Schlegel that this species never acquires a black head.

It is very possible, we think, that there may have been some error in Audubon's locality for his single specimen of this bird (coast of New Jersey), as we know that a similar mistake has been made by him in other cases.

6. STERNA CASSINII.

Sterna antarctica, Peale (*nec* Less., *nec* Forst.); Ph. et Landb. Cat. Av. Chil. p. 49.

Sterna meridionalis, Cassin, Zool. U. S. Expl. Exp. p. 385 (*nec* Brehm).

Sterna cassinii, Sclater, P. Z. S. 1860, p. 391; Pelzeln, Orn. Novara-Reise, p. 153; Abbott, Ibis, 1861, p. 166.

Sterna wilsoni, Burm. Syst. Ueb. iii. p. 451.

Sterna hirundo, Max. Beitr. iv. p. 865.

Hab. Falklands (*Pack, Abbott*); coast of Brazil, Sta. Catherina (*Rogers*); coast of Chili, up to Valdivia (*Ph. et Landb.*).

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* There is a beautiful adult specimen of this species in the Museum at Munich, which has recently been examined by Salvin. It was sent from Chili by Herr Leybold of Valparaiso. This specimen justifies Prof. Schlegel's surmise respecting the colour of the head of the adult bird of this Tern. The whole head is pure white; a dark transocular line traversing each side of the head, the rest of the body, except the rump, which is white, is light grey. The bill is black, the base being yellowish and the tip yellow. Feet yellow.

We have before us specimens of this well-marked species from the Falklands, Straits of Magellan, and coast of Southern Brazil, that from the Falklands being Sclater's type. Messrs. Philippi and Landbeck tell us that it ranges up the western coast of South America as far as Valdivia. P. Max. obtained it off Rio de Janeiro on the eastern coast, but did not distinguish from *S. hirundo.*

This species is easily distinguishable by its wholly coral-red bill from all other Neotropical species.

7. STERNA DOUGALLI.

Sterna dougalli, Mont. Orn. Dict.; Sund. Öfv. af K. V. A. Förh. 1869, p. 589.

Sterna paradisea, Baird, B. N. A. p. 863; Léotaud, Ois. de Trin. p. 539; Coues, Ibis, 1864, p. 389; Salvin, Ibis, 1866, p. 199; Gundl. Rep. F. N. i. p. 392.

Hab. Coast of Cuba (*Gundl.*); Belize (*Salvin*); Trinidad (*Léotaud*); St. Bartholomew (*Sund.*).

This is a northern, or rather "Arctopolitan," species, which descends as far south as the West Indies and coasts of Central America. Mr. Salvin found a few pairs on one of the Keys of Belize in May 1862, and believes they were preparing to breed there.

8. STERNA SUPERCILIARIS.

Hati ceja blanca, Azara, Apunt. iii. p. 377.

Sterna superciliaris, Vieill. N. D. xxxii. p. 126, et E. M. 350.

Sterna argentea, Max. Beitr. iv. p. 871; Pelz. Orn. Bras. p. 325; Burm. Syst. Ueb. iii. p. 452, et La Plata-Reise, ii. p. 519; Coues, Ibis, 1864, p. 390; Scl. et Salv. P. Z. S. 1866, p. 200.

Hab. Paraguay (*Azara*); Rio Paraná (*Burm.*); Cuyaba (*Natt.*); coast of Brazil (*Max.*); Ucayali (*Bartl.*); Columbia (*Coues*).

We have specimens of three Neotropical species of the group of little Terns (*Sternula*) now before us. They may be readily distinguished by the colour of their bills, which in the present bird is of a uniform yellow throughout, in *S. antillarum* has a small black tip to both mandibles, whilst in *S. exilis* the whole apical half is black. Besides, *S. exilis* has a much more slender bill than the two allied species, and its under plumage is grey, not white.

Our skins of this Tern are from Southern Brazil (*Rogers*) and Cuyaba (*Natt.*); and we have also examined Mr. Bartlett's Ucayali specimens.

9. STERNA ANTILLARUM.

Sterna antillarum, Lesson, Descr. Mamm. et Ois. p. 256 (1848); Coues, Proc. Ac. Phil. 1862, p. 552; Ibis, 1864, p. 390; Salv. Ibis, 1866, p. 199; Gundl. Repert. F. N. i. p. 393.

Sterna argentea, Léotaud, Ois. de Trin. p. 545.

Sterna frenata, Gambel, Pr. Ac. Phil. 1848, p. 128.

Hab. Coast of Cuba (*Gundl.*); Trinidad (*Léotaud*); British Honduras (*Salvin*).

Of this Tern Mr. Salvin's specimens have been examined by Dr.

Coues, and are therefore *S. antillarum* as understood by that author, and fully described *l. c.* Besides its black point, the bill is shorter and not so deep as in *S. superciliaris.*

So far as we know, this species does not go further south than the West-Indian seas.

10. STERNA EXILIS.

Sterna exilis, Tsch. F. P. *Aves*, p. 306; Sclat. P. Z. S. 1867, p. 336 et p. 344.

Sterna lorata, Ph. et Landb. Wiegm. Arch. 1863, pt. 1, p. 124.

Hab. Coast of Peru, near Lima (*Nation*); Arica (*Frobeen*); coast of Chili (*Mus. Brit.*).

Sclater has already expressed his doubts as to whether *S. exilis* of Tschudi is really applicable to the present species. Tschudi's description is manifestly taken from a young bird; and all that can be said is that it is more probably applicable to this species than to any other.

There can be no doubt that this Tern is the *S. lorata* of Messrs. Philippi and Landbeck, as their description accords in every respect with our specimen from Lima.

Genus 5. GELOCHELIDON, Brehm.

1. GELOCHELIDON ANGLICA (Mont.).

Sterna anglica, Mont. Orn. Dict. Suppl.; Max. Beitr. iv. p. 867.

Gelochelidon anglica, Coues, Ibis, 1864, p. 389; Salvin, Ibis, 1866, p. 199; Gundl. Repert. F. N. i. p. 392.

Sterna aranea, Pelz. Orn. Bras. p. 325; Burm. Syst. Ueb. iii. p. 452; Baird, B. N. A. p. 859.

Hab. Coast of Cuba (*Gundlach*); Trinidad (*Léotaud*); Pacific coast of Guatemala (*Salvin*); coast of Brazil (*Max.*); Rio Janeiro (*Natt.*).

This well-known species ranges down as far south as the coast of Southern Brazil, whence we have received specimens collected by Mr. Rogers.

Genus 6. ONYCHOPRION, Wagler.

1. ONYCHOPRION FULIGINOSUS.

Sterna fuliginosa, Gm. S. N. i. p. 605; Baird, B. N. A. p. 861; Sund. Öfv. af K. V. A. Förh. 1869, p. 589.

Hydrochelidon fuliginosa, Gosse, B. Jam. p. 433.

Haliplana fuliginosa, Coues, Ibis, 1864, p. 392; Salvin, Ibis, 1866, p. 200; Gundl. Rep. F. N. i. p. 393.

Sterna luctuosa, Ph. et Landb. Wiegm. Arch. 1866, pt. 1, p. 126.

Hab. West Indies, Cuba (*Gundl.*); Jamaica (*Gosse*); Belize (*Salvin*); coast of Chili (*Ph. et Landb.*).

2. ONYCHOPRION PANAYENSIS.

Sterna panayensis, Gm. S. N. i. p. 607.

Haliplana panayensis, Salvin, Ibis, 1864, p. 381, et 1866, p. 199.

Haliplana panaya, Coues, Ibis, 1864, p. 391.

Onychoprion panaya, Gould, B. Austr. vii. pl. 33.

Sterna nubilosa, Sund. Öfv. af K. V. A. Förh. 1869, p. 589.

Haliplana discolor, Coues, Ibis, 1864, p. 392; Lawr. Ann. L. N. Y. viii. p. 104; Elliot, Birds N. Am. ii. pl. 57.

Hab. British Honduras (*Salvin*); West Indies, Sombrero (*Allen*).

Genus 7. HYDROCHELIDON, Boie.

1. HYDROCHELIDON FISSIPES.

Sterna fissipes, Linn. S. N. i. p. 228.

Sterna plumbea, Wils. Am. Orn. vii. pl. 60; Pelz. Novara-Reise, Orn. p. 155.

Hydrochelidon plumbea, Baird, B. N. A. p. 864.

Hydrochelidon fissipes, Coues, Ibis, 1864, p. 391; Gundl. Repert. F. N. i. p. 393; Salv. Ibis, 1864, p. 385.

Hab. West Indies, coast of Cuba (*Gundl.*); coast of British Honduras (*Salvin*); Chili (*Pelzeln*).

Subfam. III. LARINÆ.

Genus 1. LARUS.

Sect. A. BLASIPUS, Bruch*.

1. LARUS MODESTUS.

Larus modestus, Tsch. Wiegm. Arch. 1843, pt. 1, p. 389; F. P. *Aves*, p. 53 et p. 306, t. 35; Pelz. Orn. Nov. Exp. p. 151; Ph. et Landb. Cat. Av. Chil. p. 48.

Larus bridgesi, Fraser, P. Z. S. 1845, p. 16, et Zool. Typ. t. 69.

Blasipus bridgesi, Bp. Rev. Zool. 1855, p. 21, et Consp. ii. p. 212.

Hab. Pacific coast of Peru, south of Lima (*Tsch.*); Valparaiso (*Bridges*); Chili (*Segeth*).

Of this Gull we have seen only the specimens in the British Museum, one of which is the type of Fraser's *L. bridgesi*. It is certainly quite distinct from *Larus fuliginosus*, although more nearly allied to it than to any other species. Mr. Fraser has already pointed out the differences between them. Of these, the more slender bill renders the present bird recognizable in every stage. Besides in the adult *L. fuliginosus* there is a distinct black hood, which is entirely wanting in *L. modestus*.

2. LARUS FULIGINOSUS.

Larus fuliginosus, Gould, Zool. Beagle, iii. p. 141; Sclat. et Salv. P. Z. S. 1870, p. 323.

Leucophæus fuliginosus, Bp. Consp. ii. p. 232.

Hab. Galapagos (*Darwin*, *Habel*).

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* This MS. generic name of Bonaparte was first published by Bruch (Journ. f. Orn. 1853, p. 108), with *L. modestus*, Tschudi, for the type. Lawrence (B. N. A. p. 848) gives 1852 as the date of the genus, but no reference; Gray (List of Gen. p. 130) does the same; but Bonaparte (Rev. Zool. 1855, p. 21) expressly states that both this name and *Leucophæus* of his MS. were first published by Bruch in 1853.

This is a very distinct species, quite erroneously united by some authors to *L. belcheri*, and by others to *L. modestus*. The young bird is of a uniform brown, very similar to the corresponding stage of *Larus heermanni*, but immediately recognizable by its much stouter bill. The adult bird is of a nearly uniform cinereous, with a well-marked blackish hood; the wing-primaries are black; the tail cinereous like the body, with the upper coverts greyish white and the under coverts still paler. The legs and feet are black; the bill black, with the point of the upper mandible reddish. The small ciliary plumes all round the eye are of a bright reddish orange.

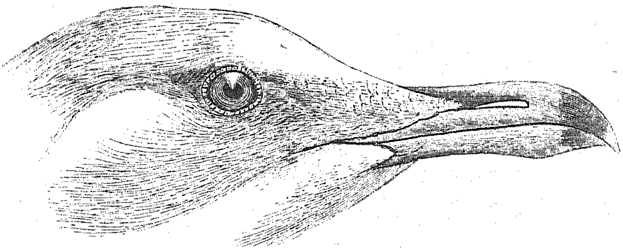
3. LARUS HEERMANNI.

Larus heermanni, Cass. Proc. Acad. N. Sc. Phil. vi. 187 (1852), et B. Calif. p. 28, pl. 5.

Blasipus heermanni, Bp. Consp. Av. ii. p. 211; Baird, B. N. A. p. 849; Coues, Ibis, 1864, p. 388; Salvin, Ibis, 1866, p. 198.

Hab. Coast of Western Mexico (*Abert*); Pacific coast of Guatemala (*Salvin*).

Fig. 3.



Head of *Larus heermanni* (reduced one-third).

Our reason for including this Gull in the list of Neotropical *Laridæ* is its occurrence on the western coast of Guatemala, where, however, Salvin only obtained it in immature plumage.

From the Museum of the University of Cambridge we have received a very fine series of skins of this species for examination. These were collected by the late Mr. James Hepburn, F.Z.S., on various points of the coasts of British Columbia and California. A very slight examination of them is sufficient to show how mistaken Prof. Schlegel was in uniting *Larus heermanni* to *L. belcheri* and *L. fuliginosus*. *L. heermanni* is in plumage most like *L. belcheri*, but immediately distinguishable by its paler mantle and grey lower back, and by the tail being black at its base and merely tipped with white. In the present species also (see fig. 3) the frontal feathers advance along the nasal grooves, on each side of the culmen, nearly up to the opening of the nostrils. In *L. belcheri* (as shown in fig. 4, p. 575), the nasal grooves are bare of feathers to a very much greater extent.

We have not had an opportunity of comparing *L. heermanni* with *L. crassirostris* of the seas of Japan and China; but, judging by what Prof. Schlegel says (Mus. des P.-B. *Lari*, p. 8), it must be distinct. In *L. heermanni* adult the bill is bright red crossed by a blackish band towards the tip, and the feet are nearly black. Prof. Schlegel describes the bill of *L. crassirostris* as yellow, and its feet as yellow or greenish.

4. Larus belcheri.

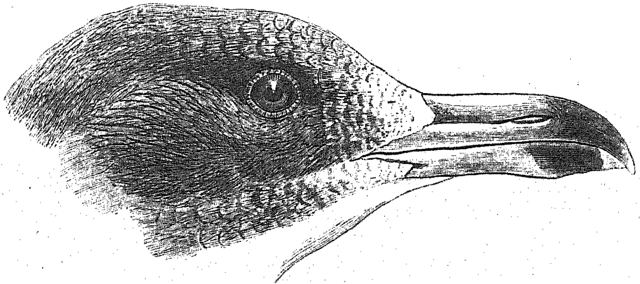
Larus belcheri, Vig. Zool. Journ. iv. p. 358 (1829); Zool. Beechey's Voy. p. 39; Scl. et Salv. P. Z. S. 1867, p. 991; Schleg. Mus. des P.-B. *Lari*, p. 9.

Larus frobeeni, Ph. et Land. Wiegm. Arch. 1861, p. 292; Cat. Av. Chil. p. 48.

Leucophæus belcheri, Bp. Consp. ii. p. 232.

Hab. Coast of Peru, Islay (*Whitely*); Arica (*Frobeen*); Straits of Magellan (*Ph. et Landb.*).

Fig. 4.



Head of *Larus belcheri* (reduced one-third).

This Gull is quite distinct from the three preceding species, with all of which it has been confounded, as we have already pointed out above.

Messrs. Philippi and Landbeck have lately given an excellent description of it under the name *Larus frobeeni*.

The British Museum contains a fine adult specimen of this Gull, obtained by Mr. Whitely at Islay; and Salvin and Godman have an immature bird with a blackish cap, from the same collector and locality.

This bird cannot, in our opinion, be associated with *L. scoresbii* in the genus *Leucophæus*, not having the short and curiously wrinkled bill of that species. It stands, however, somewhat alone, having the base of the bill more bare than in typical *Larus* (in which the small frontal plumes project forward on each side of the culmen nearly up to the nostrils), and will probably ultimately rank as a distinct generic form.

Sect. B. LARUS.

5. LARUS ARGENTATUS, Brünn.

Larus argentatus, Brünnich; Baird, B. N. A. p. 844.

Larus smithsonianus, Coues, Pr. Ac. Phil. 1862, p. 296; Gundl. Rep. F. N. i. p. 391.

Hab. Coast of Cuba, acc. (*Gundlach*).

This is probably only a straggler into the northern part of the Neotropical region.

6. LARUS DOMINICANUS.

Larus dominicanus, Licht. Doubl. p. 82; Max. Beitr. iv. p. 850; Gray, Gen. of B. iii. pl. 180; Darwin, Zool. Voy. Beagle, iii. p. 142; Cassin, Gilliss's Exp. ii. p. 204; Ph. et Landb. Cat. Av. Chil. p. 47; Gould, P. Z. S. 1859, p. 97; Sclater, P. Z. S. 1860, p. 390; Abbott, Ibis, 1861, p. 165.

Larus vociferus, Burm. Syst. Ueb. iii. p. 448, et La Plata-Reise, ii. p. 518.

Larus azaræ, Pelz. Orn. Novara Exp. p. 151; Orn. Bras. p. 323.

Hab. Coast of Brazil (*Licht.*, *Max.*, *Burm.*); Ilha de Marambaya, Sapitiba (*Natterer*); Pampas of Buenos Ayres (*Darwin*); coast of Chili (*Ph. et Landb.*); Falklands (*Abbott*).

Of this Neotropical representative of *Larus fuscus* of our seas there are now living examples in the Society's Gardens from the Falkland Islands and from Chili. They are readily distinguishable from their European allies by their darker mantle and pale *flesh-coloured* legs. *L. dominicanus* appears to be a very abundant species on both coasts of South America, from the extreme south up to Southern Brazil on the east, and Peru on the west.

Sect. C. CHROOCEPHALUS[*].

The Neotropical Hooded Gulls in their adult plumage may be shortly diagnosed as follows:—

a. primariis externis totis nigris	1. *atricilla.*
b. primariis ext. albo nigroque variegatis.	
a. cucullo nigro.	
major: pallio dilute cinereo secundariis concoloribus	2. *serranus.*
minor: pallio obscure cinereo secund. albo terminatis	3. *franklini.*
b. cucullo brunneo	4. *glaucodes.*
c. cucullo plumbeo	5. *cirrhocephalus.*

7. LARUS ATRICILLA.

Larus atricilla, Linn. Syst. Nat. i. 225; Natt. Orn. Bras. p. 323 Sund. Öfv. af K. V. A. F. 1869, p. 590.

Larus ridibundus, Léotaud, Ois. de Trin. p. 532.

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[*] Usually written *Chroicocephalus*, or *Chrœcocephalus* as amended by Strickland. But if, as we suppose, the derivation is χρὼs, χροὸs, *color*, this is the proper orthography.

Chroicocephalus atricilla, Baird, B. N. A. 850; Coues, Ibis, 1864, p. 388; Gundl. Rep. F. N. i. p. 391; Newton, Ibis, 1859, p. 371.

Xema atricilla, Cab. in Schomb. Guian. iii. p. 761.

Hab. West Indies, Jamaica (*Gosse*), St. Croix (*Newton*), St. Bartholomew (*Sund.*); Cuba (*Gundl.*); Atlantic and Pacific coasts of Guatemala (*Salvin*); Guiana (*Schomb.*); Lower Amazon, near Pará (*Natterer*).

8. LARUS SERRANUS.

Larus serranus, Tsch. Wiegm. Arch. 1844, p. 314; Faun. Per. *Aves*, p. 307; Burm. Syst. Ueb. iii. p. 449, et La Plata-Reise, ii. p. 519; Scl. et Salv. P. Z. S. 1869, p. 158.

Larus bonapartii, Scl. et Salv. P. Z. S. 1868, p. 178.

Chroicocephalus personatus, Bruch, Journ. f. Orn. 1855, p. 289.

Larus personatus, Schlegel, Mus. des P.-B. *Lari*, p. 35.

Gavia personata, Blasius, J. f. Orn. 1865, p. 372.

Hab. Sierra and Puna regions of Peru (*Tsch.*); Islay and Tinta (*Whitely*); Bolivia (*D'Orb.*); rep. Argentina, Mendoza (*Burm.*).

The first skin of this Gull received from Mr. Whitely was in immature plumage, and was wrongly identified by us with *L. bonapartii*. It is, however, unquestionably identical with skins of birds in full plumage of the present species subsequently received from the same collector.

In its adult dress *L. serranus* is an unmistakable species, from its large size and deep-black head.

9. LARUS FRANKLINI.

Larus franklinii, Swains. F. B. A. ii. p. 424, pl. 71 (1831); Sund. Öfv. af K. V. A. F. 1869, p. 590.

Chroicocephalus franklinii, Bruch, J. f. O. 1853, p. 289; Baird, B. N. A. p. 851.

Larus pipixcan, Wagl. Isis, 1831, p. 515*.

Chroicocephalus kittlizii, Bruch, J. f. O. 1853, p. 104(?).

Larus cinereo-caudatus, Ph. et Landb. Wiegm. Arch. 1861, p. 293.

Larus cucullatus, Licht. Nomencl. p. 98 (*descr. nulla*).

Chroicocephalus cucullatus, Bruch, Journ. f. O. 1853, p. 290; Baird, B. N. A. 851; Coues, Ibis, 1864, p. 388; Salvin, Ibis, 1866, p. 198.

Hab. Lakes of Mexico (*Keerl et Boucard*); Pacific coast of Guatemala (*Salvin*); St. Bartholomew (*Sund.*); Panama (*Suckley*); coast of Chili, north of Concepcion (*Ph. et Landb.*).

After what Blasius has said in his critical remarks upon the *Laridæ* (Journ. f. Orn. 1865, p. 371), there can be little doubt that *L. cucullatus* is identical with *L. franklini*. We have ourselves gone carefully into this question, and can arrive at no other conclusion, although the American ornithologists appear to be of a different opinion.

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* In the Munich Museum there are six specimens of this Gull, which are probably Wagler's types, as they are named *Larus pipixcan*, and are labelled as coming from Mexico. All these specimens are immature, but are of different ages. They belong, no doubt, to *L. franklini*.—O. S.

Fine adult specimens of this Gull received from the lakes of Mexico agree well with Wagler's description of his *Larus pipixcan* from the same locality. On the Pacific coast of Guatemala Salvin obtained one specimen in immature plumage, and saw others. The skin thus collected was identified by Dr. Coues as *Larus cucullatus*, who likewise records the occurrence of this species under this name as far south as Panama (Proc. Acad. Sc. Phil. 1862, p. 309).

The fact of this Gull extending still further southwards, to Peru and Chili, is somewhat remarkable, but there seems to be little doubt on the subject. A specimen of *Larus franklini* in the British Museum is stated to have been obtained at Valparaiso by Burnett and Fitzroy; and a skin in immature plumage (exactly resembling the Guatemalan specimen) was purchased of the Maison Verreaux, marked "Chili." Besides this evidence, Messrs. Philippi and Landbeck's description of their *L. cinereo-caudatus* agrees accurately with *L. franklini* (*cf.* Sclater, P. Z. S. 1867, p. 336).

In the immature birds of this species the primaries are nearly uniform dark brown, whitish on the inner web, and the tail has a broad black subterminal band.

10. LARUS GLAUCODES.

Larus glaucodes, Meyen, Obs. Zool. p. 115, pl. 24; Burm. Syst. Ueb. iii. p. 449; Cassin, Gilliss's Exp. ii. p. 204; Ph. et Landb. Cat. Av. Chil. p. 48.

Larus glaucotis, Schlegel, Mus. des P.-B. *Lari*, p. 42.

Gavia glaucotis, Blasius, J. f. Orn. 1865, p. 374.

Larus albipennis, Licht. MS.

Gavia roseiventris, Gould, P. Z. S. 1859, p. 97.

Larus roseiventris, Scl. P. Z. S. 1860, p. 391; Abbott, Ibis, 1861, p. 166.

Hab. Coast of Chili (*Meyen*); Falkland Islands (*Abbott et Pack*).

All the Patagonian and Chilian specimens of this Gull that we have met with belong, in our opinion, to one species, for which Meyen's name is the first. Skins from the Falkland Islands (*Gavia roseiventris*, Gould) are quite undistinguishable from Chilian examples, as Prof. Blasius (after examining Gould's type) has already stated*.

11. LARUS CIRRHOCEPHALUS.

Gaviota cenicienta, Azara, Apunt. iii. p. 350.

Larus cirrhocephalus, Vieill. N. D. xxi. p. 500, et E. M. p. 345; Gal. Ois. ii. t. 289; Scl. et Salv. P. Z. S. 1869, p. 146; Hudson, P. Z. S. 1870, p. 802.

Larus poliocephalus, Temm. Man. d'Orn. ii. p. 780 (1820); Max. Beitr. iv. p. 854.

Cirrhocephalus plumbeiceps, Bruch, Journ. f. O. 1855, p. 288.

Larus maculipennis, Burm. Syst. Ueb. iii. p. 448, et La Plata-Reise, ii. p. 518.

Hab. Pampas of La Plata (*Azara, Burm.*).

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* Journ. f. Orn. 1865, p. 374.

Not having been able to examine authentic specimens of this species (from La Plata and South Brazil), we reserve our remarks on it for a future occasion. If, as Bruch says, the cap of the adult bird is grey like the back (J. f. Orn. 1855, p. 288), there can be no doubt of its distinctness from the brown-headed *L. glaucodes*. Blasius and Schlegel both consider this bird identical with *L. phæocephalus*, Sw., of the coast of Africa.

As regards *Larus maculipennis* of Lichtenstein, Blasius is of opinion that it is a distinct species, allied to *L. glaucodes**. But *L. maculipennis* of Burmeister certainly belongs to the present bird.

Genus 2. LEUCOPHÆUS, Bp.

1. LEUCOPHÆUS SCORESBII.

Larus scoresbii, Trail, Mem. Wern. Soc. iv. p. 514 (1823); Pelz. Orn. Novara Exp. p. 151; Abbott, Ibis, 1861, p. 165; Sclater, P. Z. S. 1860, p. 391.

Larus hæmatorhynchus, King, Zool. Journ. iv. p. 103 (1828); Jard. et Selb. Ill. Orn. t. 106; Darwin, Zool. Beagle, iii. p. 142; Ph. et Landb. Cat. Av. Chil. p. 48.

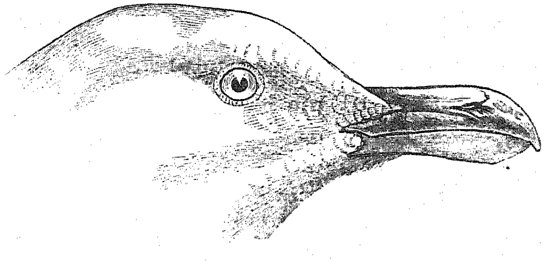
Leucophæus hæmatorhynchus, Bruch, J. f. Orn. 1853, p. 108, et 1855, p. 287.

Leucophæus scoresbii, Blasius, J. f. Orn. 1865, p. 378.

Hab. Patagonia, Port St. Julian (*Darwin*); Falkland Islands (*Abbott*); Chiloe (*Ph. et Landb.*).

This Gull is easily recognizable in every state of plumage by the peculiar form of the bill, which fully entitles it to generic rank. The young bird has a brown cap, just as in *Larus belcheri*, which disappears in the adult.

Fig. 5.



Head of *Leucophæus scoresbii* (reduced one-third).

Subfam. IV. LESTRIDINÆ.

Genus LESTRIS, Ill.

1. LESTRIS ANTARCTICUS.

Lestris antarcticus, Less. Trait. d'Orn. p. 606 (1831); Abbott,

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* Journ. f. Orn. 1865, p. 374.

Ibis, 1861, p. 165; Sclater, P. Z. S. 1860, p. 390; Scl. et Salv. Ibis, 1869, p. 284; Ph. et Landb. Cat. Av. Chil. p. 47.

Stercorarius antarcticus, Pelzeln, Orn. Novara, p. 150; Ph. et Landb. Av. Chil. p. 47.

Stercorarius catarrhactes, Schl. Mus. des P.-B. *Lari*, p. 45.

Hab. Patagonia (*Cunningham*); Falkland Islands (*Abbott*).

It seems to be very doubtful whether this Skua is really distinct from the Arctic form. We have not been able to examine a sufficient number of specimens to satisfy ourselves upon this point.

Appendix specierum nobis nondum obviarum.

1. *Sterna acutirostris*, Tsch. Faun. Per. *Aves*, p. 305, from the highlands of Peru, found in company with *Larus serranus*.
2. *Sterna atro-fasciata*, Ph. et Landb. *l. c.* p. 204, et Cat. Av. Chil. p. 49, from Colchagua, Chili.

4. Review of the Genus *Ptiloris*, Swainson.

By D. G. Elliot, F.L.S., F.Z.S., &c.

[Received June 7, 1871.]

Having for some time devoted my attention to the various genera containing the different species of the Birds of Paradise, preparatory to publishing a monograph of that beautiful family, I propose in the present paper to offer some remarks upon the species of the genus *Ptiloris*, concerning which not a little confusion regarding the proper appellation and synonymy of two of them is to be observed in various ornithological publications. Two totally different species have been confounded together under the name of *magnificus*—one inhabiting New Guinea, the other the north-eastern portion of Australia. About a year ago, a fine collection of birds from Cape York, Australia, containing numerous examples of the Rifle-bird, figured by Mr. Gould as *magnificus*, arrived in London; and lately I have received examples of the New-Guinea species. On comparing the birds from these separate localities, their differences were at once appreciable; and it is only necessary to ascertain to which one the term of *magnificus* was originally applied, as it is evident they cannot both be retained under the same name. Vieillot in the 'Nouveau Dictionnaire d'Histoire Naturelle' (1819), vol. xxviii. p. 167, described the bird from New Guinea under the name of *Falcinellus magnificus*; and this has ever since been applied, under various generic terms, to both species of Rifle-birds indiscriminately by all ornithologists who have had occasion to mention them. One, and probably the chief cause of this mingling together of distinct forms is the great difficulty experienced by all collectors in obtaining good specimens of the birds from both the localities in which they are found, the majority heretofore received being without wings or legs or some other important member, and it is only lately that fine examples have been obtained. Mr. George Robert Gray, some time ago, perceived that there were differences among the specimens of this section of the Rifle-birds in the British Museum, and in his manuscript notes affixed to the one from Australia the name of *Ptiloris alberti*, but never published or wrote any account of it; and in his latest published work, the 'Hand-list of Birds,' he has placed his manuscript name among the synonyms of *Ptiloris magnificus*, which he rightly applies to the New-Guinea bird. Although among ornithologists it is generally conceded that manuscript names should not be recognized or adopted, I propose, in this instance, to make an exception to the practice, and to retain the name of *alberti* for the Australian bird. It is not to be denied that I should be perfectly right if I gave a new appellation to the species, as even the adoption of a manuscript name is not to be commended, as it is a kind of recognition that they may be noticed; but my desire is and always has been to clear up imperfectly known facts, and not to continue existing confusion; therefore as *alberti* has been employed in Mr. Gray's list, it is perhaps better to retain it, although an apology to my fellow ornithologists is due for so doing. Resembling each other very closely, there is nevertheless a considerable difference in the size and plumage of the two species, especially between the females, where the variations are very great and visible at once.

The true *P. magnificus* is much the larger bird, has a longer, stouter bill, stouter legs and feet, and longer wings. The chief difference in their plumage is to be seen upon the lower part of the breast, which in the New-Guinea bird is rich purplish violet, as mentioned by its describer, Vieillot, while the *P. alberti* is dark grass-green upon the same parts, the ends of the flank-feathers only being tinged with violet. The metallic colours of the throats and breasts are apparently the same, as are also the central tail-feathers. But it is in the females that the greatest variation in the hue of the plumage is to be seen, that of *P. magnificus* being of a rich brownish red upon the entire upper parts, the under parts white, closely barred with black; while the female of *P. alberti* is a light olive-brown upon the upper parts, wings and tail being rufous brown, and the under parts are very much lighter than in the female of its relative, the bars being narrower and wider apart. The throat is also pure white, that of the female *P. magnificus* being closely barred like the breast. I give below a list and description of the known species of *Ptiloris* with their proper synonyms added.

Genus PTILORIS.

Ptiloris, Swainson, Gen. and Class. Birds (1825), vol. ii. p. 331.

The name *Epimachus*, which has been usually applied to these birds, was originally bestowed by Cuvier upon the *E. magnus*, a form totally different from the Rifle-birds; and consequently Mr. Swainson's term is the one next in order to be employed.

PTILORIS PARADISEUS.

Ptiloris paradiseus, Swain. Zool. Journ. vol. i. p. 481; Gray, Gen. of Birds, p. 15; Cab. Mus. Hein. Theil i. p. 214; Reich. Hand. der Spec. Orn. p. 328; Gould, B. of Austr. vol. iv. pl. 100; *id.* Handb. B. of Austr. vol. i. p. 591; Gray, Hand-l. Birds, part i. p. 105. sp. 1271.

Epimachus brisbani, Wils. Ill. of Zool. pl. 9.

Epimachus regius, Less. Zool. Voy. de la Coq. pl. 28.

Hab. South-east Australia (*Gould*).

Male. Top and back of head, with a large diamond-shaped mark upon the throat, bright metallic green; neck, back, and upper part of the breast rich deep purple; secondaries velvety black with purplish gloss; primaries black; flanks, lower part of breast, and abdomen very dark rich green; two central feathers very brilliant metallic green; rest of feathers rich blackish brown, with a purplish gloss on the outer webs; bill, feet, and legs black.

Female. Upper part of the head dark brown, each feather having a central line of light buff; line over the eye, extending to the occiput and throat, yellowish white; entire upper parts uniform olive-brown; primaries dark brown, with the edges of both webs rufous brown; tail same colour as the primaries, without the light edges; entire underparts light buff, each feather having an irregular black V-shaped mark diagonal with the shaft; bill, feet, and legs black.

PTILORIS VICTORIÆ.

Ptiloris victoriæ, Gould, Proc. Zool. Soc. (1849), p. 111, pl. 12; *id.* Birds of Austr. Suppl. pl.; *id.* Handb. Birds Austr. vol. i. p. 593; Reich. Handb. der spec. Orn. p. 329; Gray, Hand-l. Birds, p. 105, part i. (1871), sp. 1272.

Hab. Barnard Islands, N.E. Australia (*Macgillivray, Gould*).

Male. Smaller in size but very similar in plumage to the preceding species, the principal difference being that the purple on the upper part of the breast is apparently restricted, and forms a band across that portion of the body between the metallic throat and the green of the lower parts. Bill smaller than that of *P. paradiseus*, and, with the legs and feet, black.

Female. Also closely resembles that of *P. paradiseus*, but may be distinguished by its smaller size; upper part of head dark brown, striated with greyish brown; superciliary stripe and throat buff; upper parts greyish brown, shaded with olive; underparts deep buff, the feathers having a brown spot near the tips and irregularly barred on the flanks with the same.

For the two following species, as in the colour of their plumage and texture of feathers they differ considerably from those just described, Mr. Gray has proposed the generic term of *Craspedophora*, which it may be well to retain as a subgeneric division; but there does not appear sufficient reason for removing them from the genus proposed by Mr. Swainson.

PTILORIS MAGNIFICUS.

Falcinellus magnificus, Vieill. Nouv. Dict. d'Hist. Nat. tom. xxviii. p. 167, pl. G 30. no. 3.

Epimachus magnificus, Cuv. Règ. Anim. 1829, p. 440.

Le Proméfil, Levaill. Ois. de Parad. p. 36, pl. 16.

L'Epimaque proméfil, Cuv. Règne Anim. (1817) p. 408.

Epimachus paradiseus, Gray, Gen. of Birds, vol. i. pl. xxxii.

Epimachus splendidus, Steph. Shaw's Gen. Zool. vol. xiv. p. 77.

Craspedophora magnifica, Gray, List of Gen. Birds, 2nd ed. p. 15.

Ptilorhis magnificus, Gray, Hand-l. Birds, part i. p. 165. sp. 1273.

Hab. New Guinea.

Male. Top of head and occiput, centre of throat, and entire upper part of breast shining bluish green, purple in certain lights; entire upper parts deep velvety black, with rich dark purple reflections; primaries black, with green reflections; a narrow line of green, red in some lights, beneath the metallic of the breast; breast, flanks, and abdomen purple; base of side-plumes also purple, basal half and filamentary ends black; two central tail-feathers shining green, remainder velvety black, with green reflections on their outer webs; bill, legs, and feet stout, black.

Female. Entire upper parts, wings, and tail rich brownish red; superciliary stripe white, the feathers tipped with blackish brown; cheeks and a line from the base of the lower mandible running back upon the side of the throat blackish brown; entire underparts white, narrowly barred with black; bill and feet black.

PTILORIS ALBERTI.

Ptiloris magnifica, Gould, Birds of Austr. Suppl. pl.

Craspedophora magnifica, Gould, Handb. Birds. Austr. vol. i. p. 395. sp. 365.

Ptilornis alberti, Gray, MS.

Hab. Cape York, Australia (*Macgillivray*).

Male. Smaller than the previous species; top of head, occiput, centre of throat, and upper part of breast metallic bluish green; sides of head, neck, and upper parts velvety black, with a rich purple gloss; primaries greenish black; a bright olive-green line beneath the metallic shield of the breast; rest of underparts dark olive-green, changing upon the base of the flank-plumes to a light purple; under tail-coverts black; two central tail-feathers shining metallic green, remainder black, with green reflections on the outer webs; bill and feet slender, black.

Female. Entire upper parts light olive-brown; outer edges of wings and tail rufous brown; a broad blackish-brown line from bill through the eye to the nape of the neck; superciliary stripe and throat white; a narrow brownish-black line from base of under mandible along side of the throat; upper part of breast white, narrowly barred with brownish black, lower part also white, but the bars fainter and wider apart; bill and feet black.

5. Description of a supposed new Species of Guinea-fowl from Ugogo, Central Africa. By D. G. Elliot, F.L.S., F.Z.S., &c.

[Received June 13, 1871.]

NUMIDA GRANTI.

N. *cristata, nigra; capite et gutture rubris; collo postice purpureo; cinctu collari nigro; corpore reliquo nigro, punctulis cærulescenti-albis passim maculato; primariis vix rufescenti-brunneis.*

Head with a full upright jet-black crest, like the other species belonging to this group of the genus *Numida*; entire upper part of the head and also the throat bright red; back and lower part of neck purplish black; entire plumage black, spotted all over with bluish-white dots; primaries bright brown; outer webs of the first secondaries white; tip of tail and line above knee-joint black, unspotted; bill greenish; feet and legs black.

Hab. Ugogo (*Grant*).

The present description was taken from a coloured drawing made by Colonel Grant from the only specimen shot by him during his adventurous journey with Captain Speke through Central Africa. It differs from all the species of this genus that I am acquainted with in having the head red, all the others being black in the regions of the eyes and ears, the present bird having the same colour upon those parts as is seen on the front of the throat. The drawing which Colonel Grant kindly placed in my hands is very carefully done, and is amply sufficient to illustrate the species, showing very clearly its peculiar characteristics. Colonel Grant has also handed me the following extract from his Journal:—"8th Dec., 1860.—Both off in different directions shooting from six A.M. until nine. I saw nothing except shooting a kind of Guinea-fowl with black ostrich-feather-like top-knot; back of head, eyes, and nostrils and windpipe red sealing-wax colour; neck in a loose ruffled skin of purple meeting at lower part in round collar-like edges. Body the usual bird's-eye; primary feathers brick-brown, a few of those next them edged with white. Legs black, above knee-joint jet-black feathers; the thigh spotted; not as round in body as Guinea-fowl, and very slightly compressed as seen on the ground." Although the distinguished travellers killed numbers of the common Guinea-fowl, this specimen was the only one of this form seen by them. I have great pleasure in naming it after Colonel Grant, who did so much towards bringing their hazardous journey to a successful issue, an undertaking which cannot but be regarded as one of the most remarkable ever accomplished.

6. Notes on the Localities of *Dolium melanostoma* and other Shells found in Australia and the adjacent Islands and in the Australian Seas. By JOHN BRAZIER, C.M.Z.S.

[Received May 24, 1871.]

1. CONUS RHODODENDRON.

Conus rhododendron, Couthouy, Ann. Lyc. Nat. Hist. New York.

Conus adamsoni, Gray, MS. British Museum.

Conus cingulatus, Sowerby, Tankerville Catalogue, Appendix, p. 34; Conch. Illust. f. 108.

Conus adamsoni, Reeve, Conch. Icon. pl. 4, species 22.

Conus rhododendron, Sowerby, Thes. Conch. vol. iii. frontispiece, fig. 504, p. 38, species 329.

Conus adamsoni, Chenu, Manuel de Conch. part 1, titlepage two figures, and page 249, figs. 1527 & 1528.

Hab. Bampton Reef and shoals, South Pacific Ocean, in lat., 19° 51′ S., long. 158° 20′ E. (*coll. Brazier*).

This fine and very rare species, described first by Couthouy, is not found on the Australian coast as stated by Mr. Reeve, Sowerby, and others. Of the fine variety figured by Chenu, I have only seen one specimen; and that was in the collection of my friend Mr. Hargraves. Of the type I have had four examples. As it is a deep-water shell, it is only found after heavy gales on the Reef, along with *Coni crocatus, floccatus, vitulinus, Voluta thatcheri, Strombi pacificus, samar,* and *thersites,* and *Pyrazus gourmyi.*

2. DOLIUM MELANOSTOMA.

Dolium melanostoma, Jay, Mus. Cat. 1839, p. 124, pls. 8 & 9; Reeve Conch. Icon. 1848, pl. 2. fig. 2; Catlow and Reeve, Conch. Nomenclator, p. 276.

Hab. Elizabeth Reef, South Pacific Ocean, in lat. 31° 43′ S., long. 159° E. (*coll. Brazier*).

Reeve gives the Friendly Islands as the locality of this species, but it must be an error. My examples were obtained in deep water by a black, when diving for *Holothuriæ* or Bèche-de-mer. Elizabeth Reef is four hundred and fifty miles east of Port-Jackson Heads.

3. PARTULA CALEDONICA.

Partula caledonica, Pfr. Proc. Zool. Soc. 1861, p. 389; Pfr. Mon. Hel. Viv. vol. vi. p. 157.

Hab. Havannah Harbour, Sandwich Island, New Hebrides, also Vavua Lava, or Great Island, in Banks's Islands (*coll. Brazier*).

Dr. Pfeiffer gives the locality of this species as New Caledonia on the authority of the late Mr. H. Cuming. Up to the present time, however, there has not been one of the genus *Partula* found, either in New Caledonia or the Loyalty Islands.

4. PUPINA MOULINSIANA.

Pupina moulinsiana, Fischer et Bernardi, Journ. de Conch. 1856*, p. 299, pl. 10. figs. 6 & 7; Pfr. in Mon. Pneum. Vivent. 1858, tome ii. p. 93, and 1865, tome iii. p. 92; Sowerby, Thes. Conch. vol. iii. pl. 265, *Pupinidæ*, fig. 36.

Pupina leucostoma, Montrouzier, MS.

Pupina intermedia, Angas, MS. Australian Museum.

Hab. Woodlark Island, north of the Louisiades, near the coast of Papua or New Guinea (*coll. Brazier*).

This species was described from specimens said to have been received from New Caledonia. It was taken there by the French Missionaries in their voyages from Woodlark Island. Dr. Pfeiffer, in his last number of 'Monographia Pneumonopomorum Viventium,' gives the correct locality; but Mr. Sowerby, in the 'Thesaurus Conchyliorum,' a still later work, goes back to the original New Caledonia. In going through the species in the Australian Museum, Sydney, I find two specimens named by Mr. Angas some time back when he was in Australia.

5. PUPINA MERIDIONALIS.

Pupina meridionalis, Pfr. Proc. Zool. Soc. 1863, p. 526; Pfr. Monog. Pneum. Vivent. tome iii. p. 92.

Pupinella macgillivrayi, Cox, Catalogue of Australian Land Shells, 1864, p. 32.

Pupina meridionalis, Cox, in Monograph of Australian Land Shells, 1868, p. 100, pl. 16. figs. 7, 7*a*, 7*b* (7*c*, operculum); Sowerby, Thes. Conch. vol. iii. *Pupinidæ*, pl. 265. fig. 33.

Hab. Port Denison, Queensland (*coll. Brazier*).

This species is not found in South Australia as quoted by Dr. Pfeiffer and Mr. Sowerby, their valuable conchological works not being always correct as regards the localities of the species.

6. PUPINA PLANILABRIS.

Pupina planilabris, Pfr. Proc. Zool. Soc. 1863, p. 526; Pfr. Monog. Pneum. Viven. tome iii. p. 93.

Pupinella whartoni, Cox, Catalogue of Australian Land Shells, 1864, p. 32.

Pupina planilabris, Cox, in Monograph Australian Land Shells, 1868, p. 99, pl. 16. figs. 11, 11*a*, 11*b*; Sowerby, Thes. Conch. vol. iii. *Pupinidæ*, pl. 265. fig. 34.

Hab. Port Curtis and Port Denison, Queensland, north-east coast of Australia (*Coll. Brazier*).

This is another species erroneously stated by the same authorities as in the case of the preceding one to be from South Australia.

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* Dr. Pfeiffer makes an error in his 'Mon. Pneum. Vivent.' 1858 when he refers to the description of this species in the 'Journal de Conch.' Jan. 1857. I find the description in that Journal of July 1856.

7. CYCLOTUS RECLUZIANUS.

Cyclostoma recluzianum (*Cyclotus*), Pfr. Proc. Zool. Soc. 1853, p. 51.

Cyclotus recluzianus, Pfr. in Malak. Bl. 1854, p. 80; H. & A. Adams, Gen. Rec. Moll. ii. p. 275; Pfr. in Mon. Pneum. Vivent. 1858, tome ii. p. 21, 1865, tome iii. p. 27; Reeve, Conch. Icon. pl. ix. fig. 53.

Hab. Dillon's Bay, Erromanga, New Hebrides (*coll. Brazier*).

The original or type specimens were collected at the same place by my late friend Mr. John Macgillivray; and during my visit to Erromanga, six years ago, I found it plentiful under decayed leaves in very damp places near the sea, and never upon any other island in the New Hebrides. The late Mr. Cuming was in error when he sent it to Dr. Pfeiffer with the locality "Solomon Islands." I have been through almost every island in the Solomons, and have not met with any of the genus *Cyclotus*.

8. CYCLOTUS MACGILLIVRAYI.

Cyclostoma macgillivrayi (*Cyclotus*), Pfr. Proc. Zool. Soc. 1855, p. 103; Pfr. Mon. Pneum. Vivent. 1858, tome ii. p. 21, 1865, tome iii. p. 27; Reeve, Conch. Icon. *Cyclotus*, pl. 9. fig. 57.

Hab. Aneiteum Island, New Hebrides: found inland in ravines under wood (*coll. Brazier*).

When Dr. Pfeiffer described this species, he gave the correct locality, and when he brought out his second part of 'Monographia Pneumonopomorum' he also gave it correctly, and at the same time a locality of his own, New Georgia, one of the Solomon Islands. It is impossible to find this species at any island in the Solomons. In the third part of the 'Monographia' he only gives "Nov. Hebrid.;" but it is only found on one island of the group, and not on all, as the term New Hebrides would imply.

7. Description of a new Species of *Monocondylæa*.

By SYLVANUS HANLEY.

[Received June 5, 1871.]

MONOCONDYLÆA WALPOLEI, Hanley.

Testa valde inæquilateralis, ovato-oblonga, subrhomboidea, ventricosa (in medio autem, inferne leviter concava), concentrice rugulosa, epidermide brunnea nitida vestita, antice angusta et superne angulata, postice dilatata et arcuatim rotundato-subbiangulata. Margo dorsalis antice declivis, postice leviter acclivis et paullulum subarcuatus. Margo ventralis in medio incurvatus, antice oblique et arcuatim acclivis. Area postica (seu umbonalis) lata, tripartita, superne concava, deinde indentata et rugis crassis elevatis obliquis divaricatim ornata, *inferne lata et subplanulata. Costa umbonalis rotundata, conspicua. Umbones eminentes. Lunula satis magna, lanceolata, angulatim excavata. Margarita colore salmonis cocti imbuta. Dentes validi; dens valvulæ sinistræ major et natibus propinquior.*

Long. $1\frac{1}{2}$, lat. $2\frac{1}{2}$ poll.

Hab. Sarawak, Borneo (teste *Geale*). *Mus.* Hanley.

The description of *M. tumida* of Morelet (from Venezuela) accords in many respects with the features of this well-marked species, which is not indicated in Lea's recent catalogue of the Naiades. I have named it after Mr. W. Walpole, who is bestowing his attention on a group somewhat neglected in this country.

The ligamental sinus is very conspicuous.

8. Notes on Bush-bucks (*Cephalophoridæ*) in the British Museum, with the Description of two new Species from Gaboon. By Dr. J. E. Gray, F.R.S. &c.

[Received June 1, 1871.]

(Plates XLIV.–XLVI.)

The Bush-bucks form a very distinct group of Antilopine animals, peculiar to tropical or Southern Africa, and distinguished by their conical horns arising from the hinder edge of the frontal bone, so as to be placed far behind the eyes, by their having a streak of minute pores on the cheeks in the place of the usual tear-bag, and in the hair of the forehead being elongated and forming a more or less distinct tuft between the base of the horns.

The horns are in the same situation as the hinder horns of the four-horned Antelope of Asia, but that animal has a distinct crumen or tear-bag, with a single opening.

The specimens in the Museum form themselves into two very distinct groups, characterized by the nature of the fur and the form of the skull. On account of their habits, they are distinguished by peculiar names by sportsmen, as the Duykers and the Bush-goats, and we have in the Museum the skull of an animal from the Gaboon which appears to be intermediate between them; but, unfortunately, the animal belonging to this skull is unknown.

I have referred to the 'Catalogue of Ungulata furcipeda in the British Museum,' published in 1852; and there the synonyms will be found at length.

Col. Hamilton Smith figured in Griffith's 'Animal Kingdom,' vol. iv. p. 183, a species which he called *Antilope quadriscopa*, from a living specimen, said to have come from Senegal, and no specimen like the figure has, to my knowledge, occurred again; and knowing, as I do, how very slight were the sketches and notes of my early teacher and excellent friend, which he afterwards finished up into complete drawings, I am inclined to think that a specimen of *Scopophorus* (probable *S. montanus*, which is found in W. Africa) was the origin of his species. No species of *Cephalophus*, as yet observed, has any knee-tufts.

The species may be thus arranged geographically :—

West Africa.	East Africa.	South Africa.
G. splendidula. Guinea.	*G. irrorata.* Natal.	*G. nictitans.*
G. campbelliæ. S. Leone.	*T. altifrons* ?	*G. burchellii.*
Terpone longiceps. Gaboon.	*C. natalensis.* Natal.	*C. pygmæus.*
C. melanoprymnus. Gaboon.	*C. madoqua.* Abyssinia.	
C. sylvicultrix. S. Leone.	*C. melanorheus* ?	
C. ogilbyi. Fernando Po, Gaboon.	*C. bicolor.* Natal.	
C. badius. S. Leone.		
C. rufilatus. Gambia.		
C. dorsalis. S. Leone.		
C. niger. Guinea.		
C. nigrifrons. Gaboon.		
C. coronatus. Gambia.		
C. whitfieldii. Gambia.		
C. maxwellii.		
C. melanorheus.		
C. punctulatus.		

1. GRIMMIA. (The Duykers.)

Horns elongate, more or less erect. Ears elongate, acute, covered with short hair. Fur soft, with some under-fur. Skull elongate; nose compressed; forehead flat, on the same plane as the nose; nasal oblong, elongate. (Peters, Mossamb. t. 41. f. 1, t. 42. f. 1, skulls.)

This genus appears to contain two groups of species, characterized by the skull, as I pointed out in the 'Catalogue of Ungulata in the British Museum,' p. 78. The former group contains four species, having different geographical distribution, and the latter at present only one.

The three species above referred to may be only geographic variations; but Mr. Layard and other naturalists who have lived in Africa assure me that they keep distinct, and they show no inclination to change when bred in the Zoological Gardens (see P. Z. S. 1867, p. 277).

* *Head short; suborbital pit large, concave; intermaxillaries reaching to the edge of the nasals; nose-hole moderate, sides nearly parallel.*

1. GRIMMIA NICTITANS. (The Cape Duyker.)

Cephalophus grimmia, Gray, Cat. Ungul. B. M. p. 78.

Fur yellow-brown; forehead yellowish bay; nose blackish; underside of body rather paler. Young rather greyer.

Hab. South Africa: Cape of Good Hope.

We have three specimens of this species, male, female, and young, in the British Museum. Two were from the South-African Museum.

2. GRIMMIA SPLENDIDULA. (The Guinea Duyker.)

Cephalophus grimmia, var. 1, Gray, Cat. Ungul. B. M. p. 79.

Fur bright reddish yellow; nose with a black streak; underside of body white.

Hab. Coast of Guinea: St. Paul de Loanda.

A fine male in the Museum, presented by Edward Gabriel, Esq.

It is very difficult to refer the figures of these animals to the right species; but this species and the *G. irrorata* are distinguished from *G. nictitans* by the whiteness of the underside, which in that animal is pale yellow-brown; and the two other white-bellied species differ in the hair being punctulated or uniform—all characters very difficult to represent in small figures.

3. GRIMMIA IRRORATA. (The Natal Duyker.) (Skull, fig. 1, p. 591.)

Cephalophus mergens, var. *burchellii* (part.), Sundevall.

Cephalophus grimmia, Gray, P. Z. S. 1857, t. 57. f. 1; Knowsley, Menag. t. 1, 2. f. 3.

Cephalophus campbelliæ (part.), Gray, Cat. Ungul. p. 80.

Antilope ocularis, Peters, Reise nach Mossambique, Säugeth. t. 39 (male), t. 41. f. 1 (skull), t. 42. f. 1 (skull).

Antilope altifrons (part.), Peters, Mossambique, t. 37 (female only), t. 38. f. 2 (skull, female).

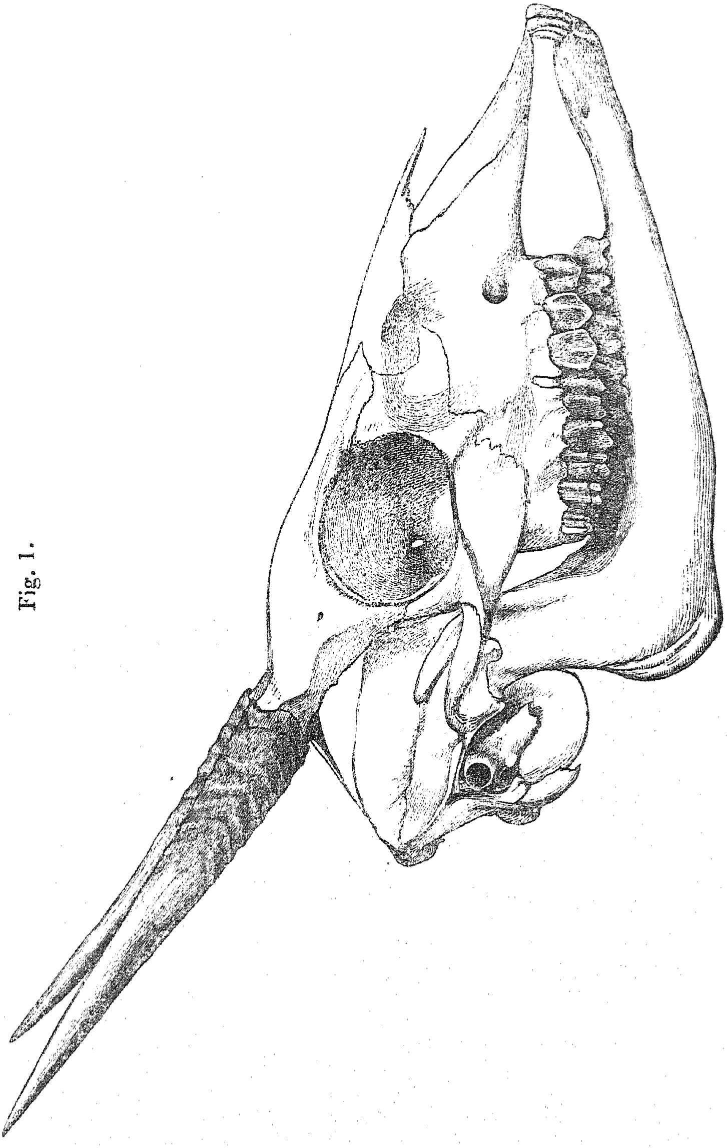
Fur greyish buff, beneath white. Male: fur paler; nose slightly black, varied. Female: fur grey, from the black tips of the hairs; nose with a decided black streak.

Hab. Natal.

There is in the Museum a male and female of this species, received from M. Sundevall as coming from Natal. I am now inclined to consider this quite distinct from *C. campbelliæ*, with which I have formerly united it.

The two animals (*Antilope ocularis*, male and its skull, and *A. altifrons*, female) figured in Dr. Peters's 'Mammalia of Mozambique' very much resemble the two specimens, the male and female, from Natal, in the British Museum—indeed, so much so, you might believe that they were drawn from the Natal specimens; but the skull, with the horns, which Dr. Peters figures as that of *A. altifrons* (male, t. 38. f. 1) appears to have the horns decumbent instead of ascending, and to have a very long compressed nose, which induces me to believe that it belongs to another species, very much like my *Cephalophus longiceps*. The figure of the skull of the male *C. ocularis* (t. 41. f. 1) differs in the shape of the impression in front of the orbit from that of the female *C. altifrons* (t. 38. f. 2), which leads me to believe they may be two species, as Dr. Peters has considered them; or it may be sexual, for it is very curious that Dr. Peters figures the same sexes as there are in the British Museum.

Fig. 1.



Skull of *Grimmia irrorata*, p. 590.

4. GRIMMIA CAMPBELLIÆ. (The Sierra-Leone Duyker.)

Cephalophus burchelli, young (*A. campbelliæ*, Gray, MS.), Gray, Cat. Mamm. 1840, p. 162.

Cephalophus campbelliæ, Gray, Cat. Ungul. B. M. p. 80.

Fur grey-and-black grizzled, paler beneath; nose and forehead with an indistinct black streak.

Hab. Sierra Leone.

Only known from a young specimen. It appears very distinct from any of the preceding.

** *Head elongate; skull elongate; suborbital pit very wide, shallow; nasal hole large, swelling out on the sides; horns shelving backwards.*

5. GRIMMIA BURCHELLII.

Cephalophus burchellii, Gray, Cat. Ungul. B. M. p. 81; P. Z. S. 1857, t. 57. f. 2; Bocage, Jorn. de Sciencias, Lisboa, 1860, p. 222.

Cephalophus grimmia (*mergens*), Knowsley Menag. t. 1, 2. f. 1 & 2.

Fur reddish brown; underside rather paler. Young dark reddish brown.

Hab. South Africa: Angola (*Bocage*).

There are four specimens in the British Museum; one, a male, has longer hair than the rest, and is probably of the winter season. It has frequently bred in the Society's Gardens.

One of the skulls in the Museum is the specimen described in Burchell's 'Travels' (vol. ii. p. 327), and which H. Smith named *A. burchellii*.

2. TERPONE.

Horns conical, strong, recurved nearly on the plane of the forehead. Ears ——? Skull elongate; nose compressed, elongate; nasal bones oblong, scarcely broader behind; forehead flattish, on the same plane as the nose, not swollen (P. Z. S. 1865, p. 205, skull).

TERPONE LONGICEPS.

Cephalophus longiceps, Gray, P. Z. S. 1865, p. 204, (f. of skull) p. 205.

Cephalophus ruficrista, Bocage, Mus. Lisbon, MS.

Hab. Gaboon (skull, B.M.); Angola (Mus. Lisbon).

Only known from a skull received, without a name, from M. du Chaillu.

The animal belonging to this skull has not been observed; and it is remarkable that a skull similar to it has been described by two others.

M. Barboza du Bocage, in the 'Jornal de Sciencias Mathematicas, Physicas e Naturaes, Lisboa,' Aug. 1869, p. 221, describes the head, covered with skin, of a specimen of *Cephalophus*, which he received from the interior of Angola, the skull of which is exactly like that of my *C. longiceps* (P. Z. S. 1865, p. 205). The ears are moderate, rounded at the end, the outer surface covered with very short, close, deep-brown hairs, nearly naked within, except at the edge and end, which is bordered with short whitish hairs. Upper surface of the head pale brown, the nose deep brown, and forehead chocolate; the upper parts of the cheeks are grey-brown, the lower part and chin whitish; a narrow, dark-edged, yellow-brown ray above the eye, and an elongate spot of the same colour under the orbit. The crest is divided into a central and lateral portions. The central portion is bright red, the lateral ones of hairs of two lengths, the shorter dark brown, and the longer bright red.

He originally named this species *Cephalophus ruficrista*, but he has now changed it to *C. longiceps*.

b. *Antilope altifrons*, Peters, Mossambique, p. 184, t. 38. f. 1 (skull of male).

Hab. Mozambique (*Peters*).

I see M. Bocage refers this figure to this group (*l. c.* p. 221).

3. CEPHALOPHUS. (Bush-goats.)

Horns conical, recurved or ascending, short, and generally angular at the front of the base. Ears moderate, rounded at the end, covered with short hair. Skull short; forehead convex, swollen; nasal bones triangular, wide behind and narrow and acute in front; preorbital pit very large. (Cat. Ungulata, t. 10. f. 1 [*natalensis*], skull.)

Fur varies greatly in different specimens. In some it is thin and closely adpressed, formed of more or less flattened hairs, which, in *C. nigrifrons*, are very broad and tapering to a point. In some, with the adpressed fur, as *C. ogilbii*, *C. natalensis*, and *C. niger*, the cheeks and neck have only extremely short fine hair on them; others, as *C. nigrifrons*, have these parts covered with broad hairs like the body. Others are clothed with abundance of cylindrical hairs, varying in different degrees of softness; in some they are more bristly, as in *C. sylvicultrix*, in others soft, sometimes with a few bristly hairs intermingled, as in *C. pygmæus*, *C. maxwellii*, and *C. melanorheus*. One species (*C. melanoprymnus*), which has a thick coat of moderately soft fur, has a crest of much longer hair extending along the whole length of the vertebral line, and a patch of softer hair over the base of the tail.

I have made some remarks on the differences between the skulls of the various species of this genus in the observations appended to the description of *C. longiceps* (P. Z. S. 1865, p. 255).

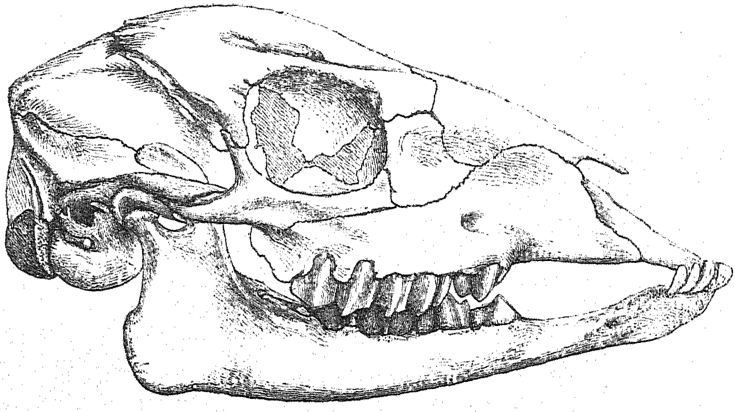
The specimens from Gaboon here described were purchased of M. du Chaillu. I do not find them mentioned in his published travels, nor in the list of animals which was published in America. Indeed in his journals he says there are no Antelopes found in that part of Africa; but perhaps he does not consider Bush-bucks Antelopes. I suppose they are common, as he used the skins with the imperfect skin of his *Potamochœrus albifrons* to stuff out the body of his *Tragelaphus albovittatus*, in the skin of which they were sewn up.

The skins have the fur in a pretty good state, the sheath of the horns being absent. The legs not having been skinned, but dried with the flesh on, are, in one or two cases, broken across at the knees, or rather wrist. The state of the legs and the skins, they having been soaked with a strong solution of corrosive sublimate, which usually makes them fall to pieces like wetted blotting-paper when they are damped, as is the case with several of the skins we purchased from him, will, I fear, prevent their being stuffed and arranged along with the other preserved specimens; but they are important additions to this family, of which we have such a complete collection in the Museum.

The species may be thus arranged for easy determination :—

a. Back with a crest of long black hair. 1. *C. melanoprymnus*.
b. Back with a large yellow stripe. 2. *C. sylvicultrix*.
c. Back with a black dorsal streak. 3. *C. ogilbii*; 4. *C. badius*; 5. *C. rufilatus*.
d. Back with a black saddle. 6. *C. dorsalis*.
e. Back uniform
  * Black. 7. *C. niger*.
  ** Red. 8. *C. natalensis*; 9. *C. nigrifrons*.
  *** Yellow. 10. *C. madoqua*; 11. *C. coronatus*; 12. *C. whitfieldii*.
  **** Blackish grey, with pale streak over the eye. 13. *C. pygmæus*; 14. *C. maxwellii*; 15. *C. melanorheus*.
  ***** Brown punctulated. 16. *C. punctulatus*; 17. *C. bicolor*.

Fig. 2.



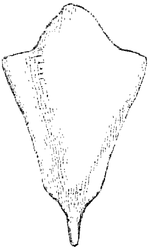
Skull of *Cephalophus melanoprymnus*.

1. CEPHALOPHUS MELANOPRYMNUS. (Plate XLIV.)

Fur rather long and soft, grizzled by the subterminal white rings on the dark-brown hairs; of outside of limbs, and especially of the middle of the back, longer (forming a vertebral crest), scarcely grizzled; rump with a large oval disk of black hair; legs dark brown; ears moderate, hairy.

Hab. Gaboon.

Fig. 3.



Nasal bone of *Cephalophus melanoprymnus.*

Female in British Museum. Differs from *C. sylvicultrix* and *C. niger* in having the very distinct black patch over the base of the tail, and also in the much greater length and softness of the fur. The fur of *C. sylvicultrix* is slightly grizzled.

2. CEPHALOPHUS SYLVICULTRIX. (Fig. 4, p. 596.)

Cephalophus sylvicultrix, Gray, Cat. Ungul. B. M. p. 83; Knowsley Menag. t. 8. f. 1, t. 23. f. 3.

Fur bristly, rather long, blackish brown, grey-grizzled, with a large yellow spot on the hinder part of the back.

Hab. West Africa: Sierra Leone.

Length of skull of adult male 10¾ inches; height at occiput 2½; width at condyles 4¾, at nasals 4½, from orbit to end of intermaxillaries 6 inches.

3. CEPHALOPHUS OGILBII, Gray, Cat. Ungul. B. M. p. 83; Knowsley Menag. t. 8. f. 2.

Fur rigid, adpressed; hairs of cheeks and neck very short, of forehead long, pale bay-brown, with a deep-black dorsal streak, paler beneath; crown and haunches brighter bay.

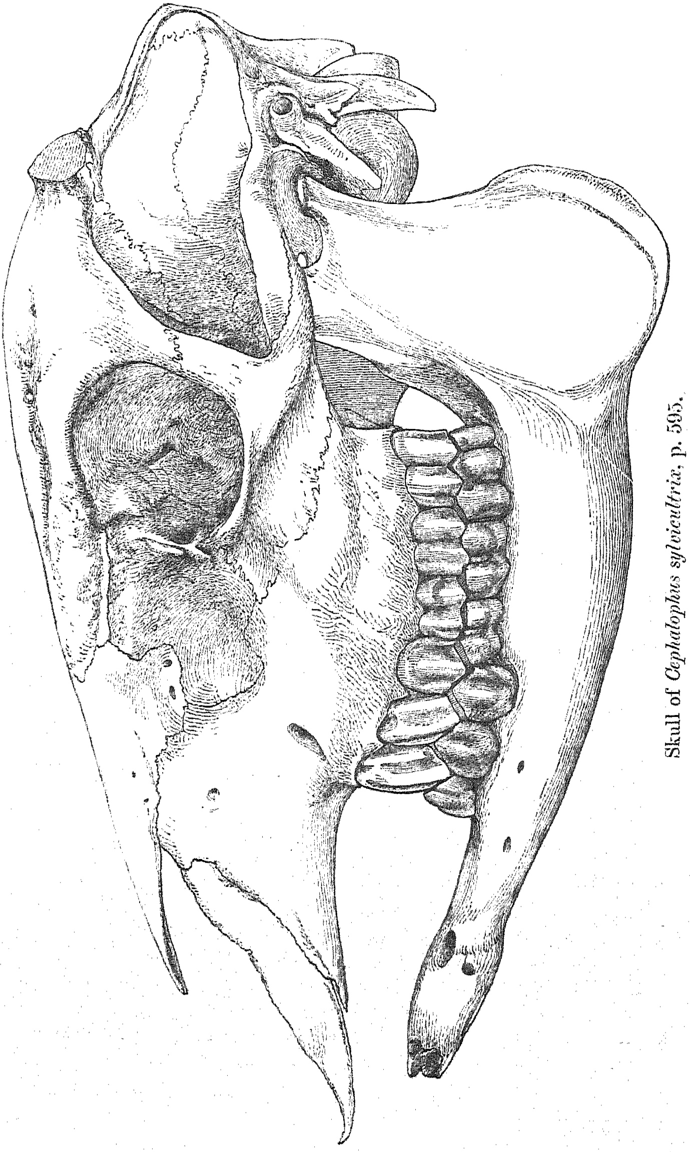
Hab. Fernando Po; Gaboon. B.M.

Two males in the British Museum, one from Fernando Po, the other from the Gaboon. The latter is brighter bay, and has a rather wider dorsal streak.

4. CEPHALOPHUS BADIUS.

Cephalophus badius, Gray, Cat. Ungul. B. M. p. 84.
Cephalophus dorsalis, Gray, Knowsley Menag. t. 7. f. 1.
Cephalophus breviceps, Gray, P. Z. S. 1866, p. 201, t. 2 (junior).

Fig. 4.



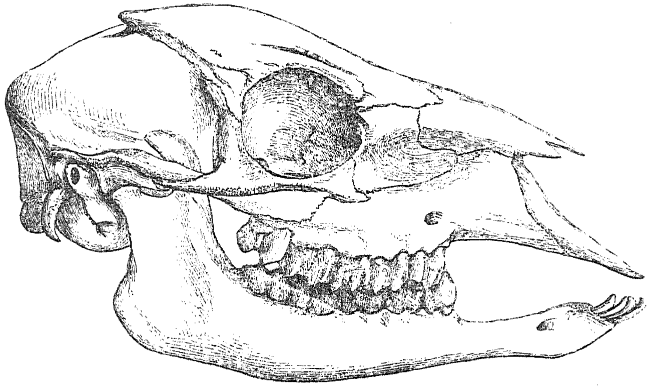
Skull of *Cephalophus sylvicultrix*, p. 595.

Fur rigid, adpressed, bright yellowish brown; crown and nape with a broad well-defined black dorsal streak.

Hab. West Africa: Sierra Leone.

The young animal described as *C. breviceps* assumed all the appearance, as it grew older, of *C. badius*.

Fig. 5.



Skull of *Cephalophus rufilatus*.

5. CEPHALOPHUS RUFILATUS.

Cephalophus rufilatus, Gray, Cat. Ungul. B. M. p. 85; Knowsley Menag. t. 6 (7). f. 3, t. 9 & 9^a.

Fur rather rigid, dark reddish bay; a dark, broad, reddish streak on the middle of the back; nose blackish grey.

Hab. West Africa: Gambia; Senegal.

Skull, length $5\frac{1}{4}$; height at occiput $2\frac{1}{4}$; length of nasals $1\frac{1}{2}$; from orbit to end of maxillary $2\frac{5}{8}$; width at zygomatic arch $2\frac{1}{2}$ inches.

6. CEPHALOPHUS DORSALIS. (Plate XLV.)

Cephalophus dorsalis, Gray, Cat. Ungul. B. M. p. 84.

Fur rather rigid, adpressed, dark bay; legs darker; crown, nape, upper part of shoulders, middle of the back, and tail black, beneath paler; fur of head and neck rather elongate.

Hab. Sierra Leone.

This appears to be a large species when full-grown, much larger than *C. badius*, and very different in having long hair round the head and on the neck.

7. CEPHALOPHUS NIGER.

Cephalophus niger, Gray, Cat. Ungul. B. M. p. 84; Knowsley Menag. t. 7. f. 2.

Fur rigid, adpressed; hair of cheeks and neck very short, sooty black; front part of body greyer.

Hab. Guinea.

A half-grown male in the Museum from the Leyden Museum.

8. CEPHALOPHUS NATALENSIS.

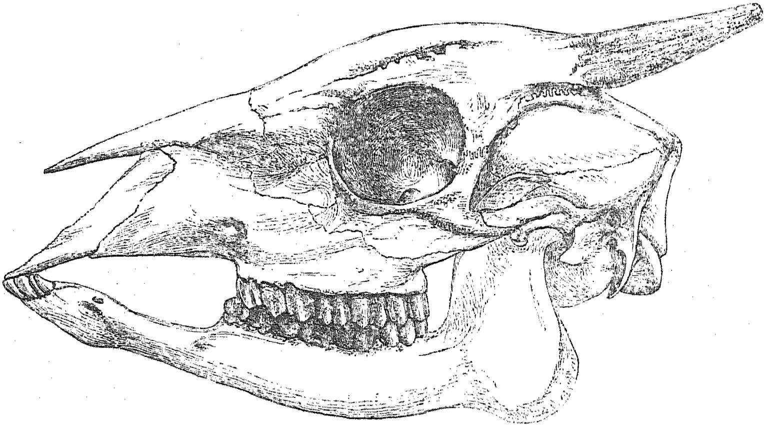
Cephalophus natalensis, Gray, Cat. Ungul. B. M. p. 85, t. 10. f. 1 (skull); Smith, Zool. S. Africa, t. 32.

Hair rigid, adpressed, of neck and cheeks short, of forehead long, bright red-bay; beneath pale yellowish; forehead red.

Hab. Port Natal.

There are four specimens in the British Museum, two males and two females.

Fig. 6.



Skull of *Cephalophus nigrifrons*.

9. CEPHALOPHUS NIGRIFRONS. (Plate XLVI.)

Head, neck, and body, above and below, covered with broad, tapering, rigid, bright bay hairs; nose, forehead, and crown between the horns with black rigid hairs, and a few black hairs interspersed on the nape and shoulders; outside of fore legs blackish; hoofs narrow, rather elongate.

Hab. Gaboon.

Somewhat like *C. badius* in colour, but much brighter, has no dorsal streak; differs from *C. natalensis* in the black forehead and tail and dark fore legs, and the hair is much more rigid.

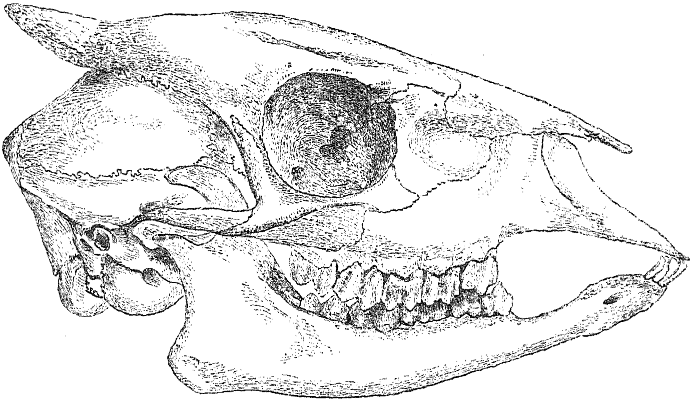
10. CEPHALOPHUS MADOQUA.

Cephalophus madoqua, Gray, Cat. Ungul. B. M. p. 82; Rüppell, Faun. Abyss. t. 7. f. 2.

Fur rigid, close-pressed, yellowish brown, slightly punctulated with black; forehead reddish.

Hab. Abyssinia.

Fig. 7.



Skull of *Cephalophus coronatus.*

11. CEPHALOPHUS CORONATUS.

Cephalophus coronatus, Gray, Cat. Ungul. B. M. p. 82; Knowsley Menag. t. 6 (7). f. 1, 2.

Fur rather soft, pale yellowish brown; back and front of legs with a few scattered black hairs; beneath whitish; ears rather long.

Hab. West Africa: Gambia.

Length of skull $5\frac{3}{4}$; height at occiput $2\frac{3}{4}$; width at condyles $2\frac{5}{8}$; length from orbit to end of maxillary $2\frac{5}{8}$; length of nasals $1\frac{7}{8}$ inches.

12. CEPHALOPHUS WHITFIELDII.

Cephalophus whitfieldii, Gray, Cat. Ungul. B. M. p. 88; Knowsley Menag. t. 11. f. 2.

Fur soft, yellowish ash; shoulders, outside of limbs, and hind part of back rather darker; hair ashy grey, brown at the ends, with yellow tips.

Hab. West Africa: Gambia. B.M.

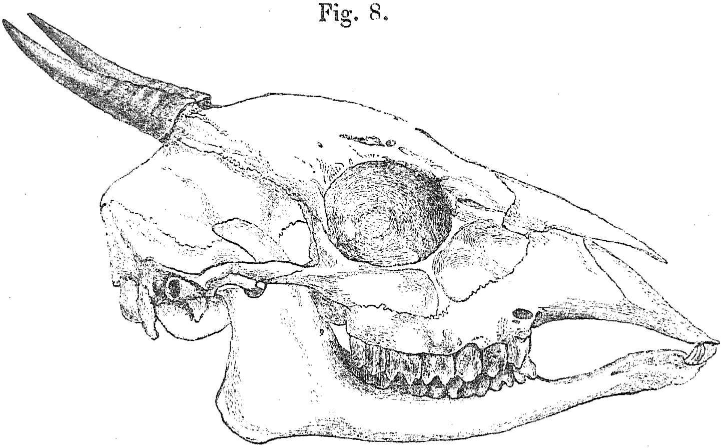
13. CEPHALOPHUS PYGMÆUS.

Cephalophus pygmæus, Gray, Cat. Ungul. B. M. p. 87; Harris, Wild Anim. S. Africa, t. 26.

Fur soft, grey-brown, with intermixed rather rigid black hairs; beneath white; streak over eye and outer part of thighs rufous.

Hab. South Africa: Cape of Good Hope; Angola? (*Bocage*).

Fig. 8.



Skull of *Cephalophus maxwellii.*

14. CEPHALOPHUS MAXWELLII.

Cephalophus maxwelli, Gray, Cat. Ungul. B. M. p. 86; Knowsley Menag. t. 11^{a}.

Guevi, F. Cuv. Mamm. Lithog. t.

Fur rather soft, uniform, thick, grey-brown or sooty black; beneath whitish grey; a broad streak over the eyes yellowish white.

Hab. West Africa: Senegal, Gambia, and Sierra Leone; Angola (*Bocage*).

Skull of adult male: length 5 inches; height at occiput 2¼; width of zygoma 2½; length of nose from orbit 2½; length of nasals 1¾ inch.

15. CEPHALOPHUS MELANORHEUS.

Cephalophus melanorheus, Gray, Cat. Ungul. B. M. p. 88; Knowsley Menag. t. 10.

Fur soft, with intermixed rather rigid black hairs, grey-brown; beneath white; rump and upper part of tail black.

Hab. West Africa: Fernando Po (*Thomson*); Gaboon (B.M.); East Africa (*Kirk*).

16. CEPHALOPHUS PUNCTULATUS.

Cephalophus punctulatus, Gray, Cat. Ungul. B. M. p. 88; Knowsley Menag. t. 11. f. 1.

Fur soft, dark fulvous brown; beneath white; hair grey, with brown ends and a yellow subterminal ring.

Hab. West Africa: Sierra Leone (*Sabine*). B.M.

17. CEPHALOPHUS BICOLOR.

Cephalophus bicolor, Gray, P. Z. S. 1862, p. 263, t. 34.

Fur soft, brown; nose, forehead, inside of ears, chin, and underside of body, rump, and tail white.

Hab. South Africa: Natal.

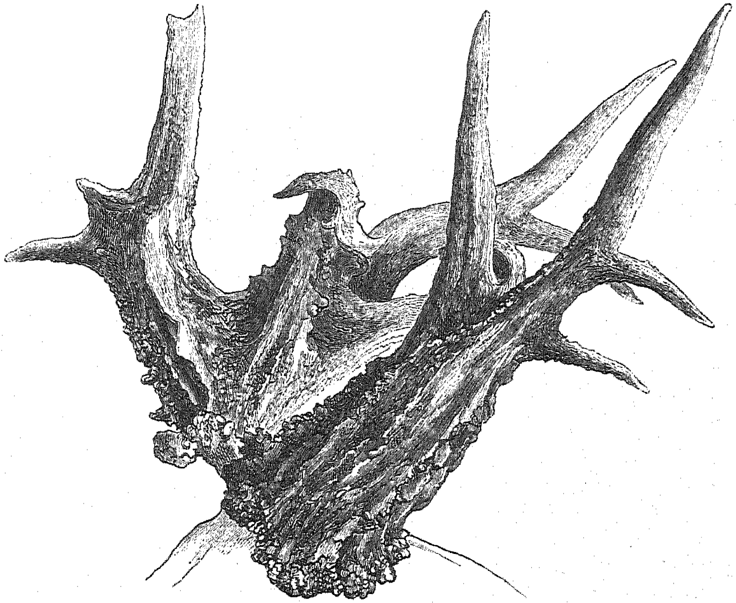
One hind leg is white (but that may be a sport; indeed the whole white may be an accidental variation): but in the general colour of the fur it is quite distinct from any other known Bush-buck. It is said to be nearly adult, though so small.

9. Notes on the Skull of a Roebuck in the British Museum.

By Dr. J. E. Gray, F.R.S.

[Received June 5, 1871.]

In the British Museum there is a skull (no. 688, *o*) which has been considered that of a Roebuck with very much deformed horns. It was received from the Museum of this Society, without any history or habitat. At first sight the horns have some resemblance to those of *Xenelaphus leucotis*, and, like it, on the two sides are very different; but in *Xenelaphus* the peculiar projection is from the back of the base of the horns, and here it is an extreme development



Supposed horns of a Roebuck.

of a snag from the front of the base of the horns, which is three-lobed at the end, two smaller lobes being directed forward and much below the erect tip.

The right horn resembles that of a much developed, but rather irregularly divided form of those of a Roebuck, with very thick and very deep longitudinal grooves, having high ridges, nodulous on the edges, occupying the whole length of the main beam to the burr, just above which they are largest and deepest; and it has on the inner side of the first furcation a thick, short, recurved snag.

The left horn is like the other, but much thicker at the base; the recurved snag on the inner side is much longer and more slender; but the usual anterior snag of this furcation is reduced to a very small conical prominence; and what seems to be equivalent to the hinder lower snag of the other horn is a dilated flattened process at the base, divided into two slender, unequal lobes at the top. But the great peculiarity of this horn is the existence of a branch springing from the front of the base of the main beam, about half as large as the horn itself, and having two conical divergent snags on the front part of the middle of its length.

Daubenton, in Buffon's 'Nat. Hist.' vol. vi. p. 241, t. 36. f. 2, 3, 4, figures three malformations of the horns of the Roebuck, but does not represent any like the one described from the specimen in the British Museum.

10. On the Birds of Cameroons, Western Africa.

By R. B. Sharpe, F.L.S. &c., Librarian to the Society.

[Received June 6, 1871.]

(Plate XLVII.)

After having quitted the field of his former labours in Madagascar, Mr. Crossley undertook an expedition to Cameroons, at the instance of Mr. Ward, of Halifax, to whom ornithologists are greatly indebted for having sent out such an indefatigable collector to so interesting a locality. As in the case of all his former collections, the specimens are admirably preserved by Mr. Crossley, who in this respect does great credit to Mr. Cutter, his agent, who trained him in preparing specimens of natural history.

The avifauna of Cameroons always possessed great attractions for me, inasmuch as I was anxious to obtain some idea of the birds of this part of Africa, believing that, from the mountainous nature of the country, some modification in the aspect of the ornithology of Gaboon and Fantee, which so closely assimilate to each other, might be expected. The result, however, proves that in its general features the avifauna of Cameroons is precisely similar to that of the two last-named countries. The proving of this fact is of great interest, as previously we were totally unacquainted with the birds of Cameroons, the bad character of the natives doubtless deterring collectors from paying the place a visit. Mr. Crossley has suffered much from their unwillingness to work, no inducement being sufficient to make them take the least trouble about any thing, and their profound laziness rendering it necessary to carry all his own collections himself from the mountains to the coast.

Beyond the record of some new birds sent by Captain Burton, and described by Mr. G. R. Gray in the 'Annals of Natural History' for 1862 (3rd series, vol. x. p. 443), and the names of a few species given in my catalogue, for which I had been indebted to Mr. Cutter, nothing whatever had been done in the way of collecting in the present locality.

In this paper the nomenclature employed is principally that used in my 'Catalogue of African Birds.'

Order PICARIÆ.

Fam. ALCEDINIDÆ.

1. CERYLE RUDIS.

Ceryle rudis (L.); Sharpe, Cat. Afr. B. p. 6.

Two specimens are sent by Mr. Crossley, killed on the 4th and 14th of February respectively. I had already received it from Cameroons in spirits through Mr. Cutter (*cf.* Cat. *l. c.*).

2. ALCEDO QUADRIBRACHYS.

Alcedo quadribrachys, Bp.; Sharpe, Cat. Afr. B. p. 6.

One beautiful specimen, killed on the 2nd of January, 1871. Previously received in spirits from Mr. Cutter.

3. ISPIDINA PICTA.

Ispidina picta (Bodd.); Sharpe, Cat. Afr. B. p. 7.

One specimen.

4. HALCYON DRYAS.

Halcyon dryas, Hartl.; Sharpe, Cat. Afr. B. p. 8.

Two specimens, killed on the 30th of November, 1870. It is doubtful whether the specimen already received by me through Mr. Cutter, and recorded as *H. malimbica* (*l. c.* p. 8) is not really of the present species; but there is a little difficulty in settling the point, owing to the birds having been preserved in spirit.

5. HALCYON CYANOLEUCA.

Halcyon cyanoleuca (V.); Sharpe, Cat. Afr. B. p. 8.

One specimen, killed on the 20th of January, 1871.

6. HALCYON SENEGALENSIS.

Halcyon senegalensis (L.); Sharpe, Cat. Afr. B. p. 8.

One example, obtained on the 26th of January, 1871.

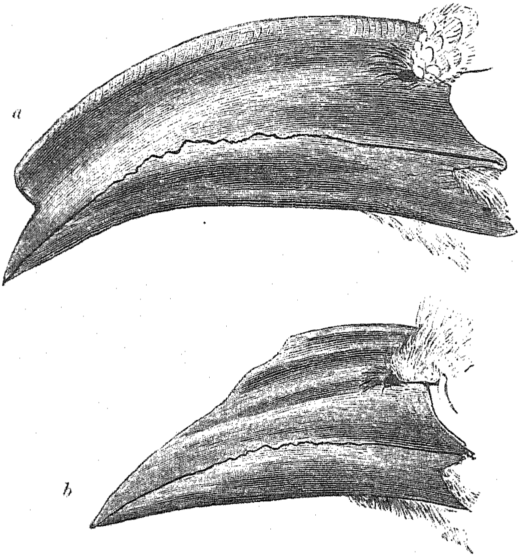
Fam. BUCEROTIDÆ.

7. BERENICORNIS ALBOCRISTATUS.

Berenicornis albocristata, Cass. Journ. Acad. Philad. i. pl. xv.

Three specimens. I must remark that all the specimens received from Fantee differ conspicuously in being much smaller, and in having the wing scarcely tipped with white. The bill also is very different, being much smaller in the Fantee bird. Although I have a good series of these Hornbills, I must wait for further evidence before describing the Fantee bird as new, as Cassin's original type came from Sierra Leone, and agrees with the Gaboon bird and not with that from Fantee, as one would expect. The accompanying figure illustrates the differences in the Hornbills from the two localities.

Fig. 1.



Bill of *Berenicornis albocristatus. a,* from Cameroons; *b,* from Fantee.

8. TOCKUS PULCHRIROSTRIS.

Tockus pulchrirostris (Schl.); Sharpe, Cat. Afr. B. p. 9.

"Cameroon Mountains, February 4th, 1871. Eye-ring grey; eyeball black."

As far as I can see, the single specimen sent by Mr. Crossley is inseparable from Fantee examples in my collection.

Fam. MUSOPHAGIDÆ.

9. TURACUS CRISTATUS.

Turacus cristatus (V.); Sharpe, Cat. Afr. B. p. 10.

A single specimen in good plumage. This fine species seems to occur in suitable localities from Sierra Leone down to Angola.

10. CORYTHAIX PERSA.

Corythaix persa (L.); Sharpe, Cat. Afr. B. p. 11.

Five specimens sent by Mr. Crossley, procured by him between the 24th of January and the 15th of February.

11. CORYTHAIX MERIANI.

Corythaix meriani, Rüpp.; Hartl. Orn. W. Afr. p. 157.

This is a beautiful species, easily distinguished from the other members of the genus by its conspicuous magenta-tipped crest. Mr. Crossley has sent one specimen, which he killed on February 1st, 1871.

Fam. CUCULIDÆ.

12. CHRYSOCOCCYX CLAASII.

Chrysococcyx claasii (V.); Sharpe, Cat. Afr. B. p. 13.

One specimen, shot on the 2nd of February, 1871.

13. CHRYSOCOCCYX CUPREUS.

Chrysococcyx cupreus (Bodd.); Sharpe, Cat. Afr. B. p. 13.

A single specimen, obtained on the 16th of February, 1871.

14. CHRYSOCOCCYX SMARAGDINEUS.

Chrysococcyx smaragdineus (Sw.); Sharpe, Cat. Afr. B. p. 13.

A beautiful specimen, killed on the 10th of February, 1871.

15. ZANCLOSTOMA FLAVIROSTRIS.

Zanclostoma flavirostris (Sw.); Sharpe, Cat. Afr. B. p. 14.

"Cameroons Mountains, January 21st, 1871. Eye-ring red; eyeball black.

"Victoria Forest."

Fam. CAPITONIDÆ.

16. TRICHOLÆMA HIRSUTA.

Tricholæma hirsuta (Sw.); Sharpe, Cat. Afr. B. p. 15.

Two young specimens, obtained on the 22nd and 25th of February, 1871. These birds are much younger than the example figured in the plate of this species given by the Messrs. Marshall in their 'Monograph of the Capitonidæ;' and as this stage of plumage has never been described, I add a short diagnosis:—

Head black; rest of the upper surface of the body brown, everywhere spotted with little golden-yellow markings, more thickly on the crown; wing-coverts exactly like the back; quills and tail very dark brown, edged with golden yellow; upper tail-coverts blackish, rather conspicuously edged with golden yellow; feathers round the eye and ear-coverts blackish, spotted with silvery white; cheeks and sides of the neck white, mottled with black; throat whitish, with longitudinal black markings down the centre of each feather; rest of the under surface of the body dull golden yellow, the upper part of the breast streaked with black, the rest of the belly and abdomen thickly marked with brown transverse spots. Total length 7·4 inches, culmen 1, wing 3·6, tail 2·1, tarsus ·8.

I am now, therefore, able to state that the immature bird figured in the plate of Messrs. Marshalls' work is very nearly adult, the only remains of young plumage being the whitish throat.

17. XYLOBUCCO DUCHAILLUI.

Xylobucco duchaillui (Cass.); Sharpe, Cat. Afr. B. p. 15.

One specimen, shot on the 4th of February, 1871.

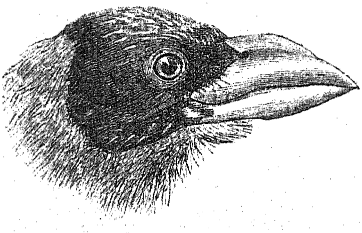
18. GYMNOBUCCO PELI.

Gymnobucco peli, Hartl. Orn. W. Afr. p. 175.

One specimen, shot on the 4th of February, 1871. The Messrs. Marshall in their 'Monograph' have united *G. peli* to *G. calvus*. But I am not quite satisfied about this identification; for it must be remembered that Dr. Hartlaub, in his original description of *G. peli*, distinctly described both male and female as having the tufts on each side of the forehead. The Messrs. Marshall, on the other hand, consider that the female is to be distinguished from the male by the absence of these tufts on the forehead. Having lately received from Fantee a fine series of these Bald-headed Barbets, I must say that I am not clear in my mind about the two birds being only sexes of one and the same species; for those birds supposed to be the female (i. e. *G. calvus*) have much larger bills than the supposed males (*G. peli*). The sketches which I now exhibit (figs. 2 & 3) show the differences between the two species; and it will be observed that in *G. calvus* there is a conspicuous tuft of brush-like feathers on the chin, which scarcely exists in *G. peli*.

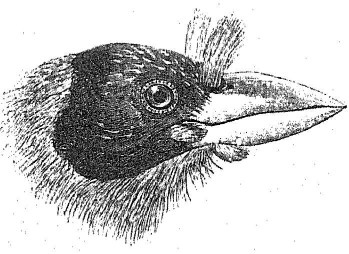
At present, therefore, I consider the two species to be distinct.

Fig. 2.



Head of *Gymnobucco calvus*.

Fig. 3.



Head of *Gymnobucco peli*.

19. TRACHYPHONUS PURPURATUS.

Trachyphonus purpuratus, Verr.; Marsh. Monogr. Capit. p. xxxii.

A beautiful specimen, killed on the 10th of February, 1871. This is identical with the true *T. purpuratus* of Gaboon, and is not *T. goffini*, which takes its place on the Gold Coast.

Fam. PICIDÆ.

20. CAMPETHERA NIVOSA.

Campethera nivosa (Sw.); Sharpe, Cat. Afr. B. p. 17.

"Cameroons Mountains, February 4th, 1871."

One female sent, identical with examples in my collection from Fantee.

Order PASSERES.

Fam. TIMALIIDÆ.

21. ALETHE CASTANEA.

Alethe castanea, Cass. Proc. Philad. Acad. 1859, p. 43.

"Cameroons Mountains, February 1st, 1871, and February 20th, 1871."

The two specimens sent by Mr. Crossley are an adult and a young bird of this species. Compared with a bird from Gaboon in my collection, obtained by Du Chaillu, Mr. Crossley's older specimen is rather larger, but is apparently a little more adult.

The species of *Alethe* may be characterized as follows:—

Clavis specierum generis Alethes.

a. capite summo læte castaneo.	
a′. cauda brunnea unicolori	1. *castanea*, Cass.
b′. rectricibus exterioribus ad apicem albis.........	2. *maculicauda*, Hartl.
b. capite cinerascente	3. *castanonota*, Sharpe.

Fam. TURDIDÆ.

22. TURDUS CROSSLEYI, sp. nov. (Plate XLVII.)

T. *supra olivaceo-brunneus, aurato lavatus, pileo uropygioque conspicue tinctis: collo postico et corpore subtus læte aurantiacis: abdomine medio et imo cum crisso pure albis: mento, genis et regione auriculari antica nigricantibus: tectricibus alarum saturate brunneis, minimis aurato lavatis, majoribus conspicue albo terminatis, fasciam duplicem alarem formantibus: rectricibus brunneis extus aurato lavatis, versus basin albis: cauda saturate brunnea vix aurato nitente: rostro nigro; pedibus pallide flavidis: long. tot.* 8·5, *culm.* 0·9, *alæ* 3, *caudæ* 2·9, *tarsi* 1·2.

Head golden brown, tinged with orange on the hinder part; a little line of feathers on each side of the forehead, at the base of the bill, orange; lores, fore part of the cheeks, and ear-coverts blackish; sides of the neck, and a collar encircling the same, orange; back golden brown; least wing-coverts blackish, strongly washed with golden brown; rest of the wing-coverts blackish brown, conspicuously tipped with white, forming a double alar band; primary coverts blackish brown, not spotted; quills rather paler brown, white at the base of the inner web; the outer web of the primaries golden brown, of the secondaries olive-brown; tail dark brown, slightly inclining to reddish and tinged with golden brown; under surface of the body rich orange; the chin blackish; centre of the breast, abdomen, and under tail-coverts pure white; under wing-coverts white, the bases of the wings blackish; bill black; feet pale yellowish. Total length 8·5 inches, culmen 0·9, wing 3, tail 2·9, tarsus 1·2.

This new species is very closely allied to *Turdus gurneyi*, Hartl. (Ibis, 1864, pl. ix.), from Natal, but is at once distinguished by its black cheeks, lores, and chin, as well as by its orange collar round the neck.

23. CRINIGER CALURUS.

Criniger calurus, Cass.; Sharpe, Cat. Afr. B. p. 21.

"Cameroons Mountains, January 19th, 1871."

"Cameroons Mountains, February 7th, 1871. Eye-ring reddish brown; eyeball black."

Both the above specimens agree with typical Gaboon examples in my collection. In Fantee and to the north this species is replaced by *C. verreauxi*, which is the name I proposed in my catalogue for the *C. gularis* (Sw. *nec* Horsf.) = *C. tephrogenys*, Jard. *apud* Finsch, J. f. O. 1867, p. 26, et Sharpe, Ibis, p. 472 (*nec* Jard. & Selby, Contr. to Orn. pl. 127). Shortly after writing my last paper on the Ornithology of Fantee (*l. c.*) I sent a specimen of the African *Criniger gularis* to Sir William Jardine, asking him to compare it with the type of his *C. tephrogenys*, and to see if the two birds were identical. In due time I received a letter from him, assuring me that they were perfectly distinct (as, indeed, any one would have imagined from the descriptions) and detailing the differences. I therefore proposed the name of *C. verreauxii* for the African bird.

24. CRINIGER TRICOLOR.

Criniger tricolor (Cass.); Sharpe, Cat. Afr. B. p. 21.

"Cameroons Mountains, January 1st, 1871."

Agrees exactly with specimens from Gaboon.

25. CRINIGER CHLORONOTUS.

Criniger chloronotus, Cass.; Finsch, Journ. f. Orn. 1867, p. 24.

"Cameroons Mountains, February 25th, 1871."

Two specimens, agreeing exactly with a typical specimen in my collection from Gaboon obtained by Du Chaillu.

26. CRINIGER NIVOSUS.

Criniger nivosus, Temm.; Sharpe, Cat. Afr. B. p. 22.

"Cameroons Mountains, February 1st and 9th. Eye-ring brown; eyeball black."

The two specimens sent by Mr. Crossley agree best with Fantee birds in my collection. Examples from this latter locality slightly incline to grey on the head, while specimens from Gaboon are more grey; but I have no doubt these slight variations are due to age or the season of the year.

27. ANDROPADUS VIRENS.

Andropadus virens (Cass.); Sharpe, Cat. Afr. B. p. 23.

"Cameroons Mountains. Sings nicely. Bill black; iris brown."

28. IXONOTUS GUTTATUS.

Ixonotus guttatus, Verr.; Sharpe, Cat. Afr. B. p. 41.

"Cameroons Mountains, January 28th and February 11th, 1871. Iris yellow."

Exactly similar to Gaboon specimens in general characters, but perhaps more tinged with brown on the back of the neck.

29. COSSYPHA POENSIS.

Cossypha poensis, Strickl.; Sharpe, Cat. Afr. B. p. 25.

"Cameroons Mountains, February 11th and 20th, 1871."

These two specimens sent by Mr. Crossley are precisely similar to a Fantee skin in my collection.

Fam. NECTARINIIDÆ.

30. NECTARINIA SUPERBA.

Nectarinia superba (V.); Sharpe, Cat. Afr. B. p. 38.

"Cameroons Mountains, February 18th, 1871."

31. NECTARINIA FULIGINOSA.

Nectarinia fuliginosa (Shaw); Sharpe, Cat. Afr. B. p. 39.

"Victoria Forest, January 7th, 1871."

"Cameroons Mountains, January 18th, 1871."

32. NECTARINIA ANGOLENSIS.

Nectarinia angolensis (Less.); Sharpe, Cat. Afr. B. p. 39.

"Cameroons Mountains, January 26th, 1871."

33. NECTARINIA CHLOROPYGIA.

Nectarinia chloropygia, Jard.; Sharpe, Cat. Afr. B. p. 39.

"Cameroons Mountains, February 2nd and 15th, 1871."

34. NECTARINIA SUBCOLLARIS.

Nectarinia subcollaris, Reich.; Sharpe, Cat. Afr. B. p. 41.

"Cameroons Mountains, February 9th, 1871."

35. ANTHREPTES AURANTIA.

Anthreptes aurantia, Verr.; Sharpe, Cat. Afr. B. p. 41.

"Victoria Forest, January 31st, 1871."

Mr. Crossley has sent a male of this lovely bird, which agrees exactly with one of the type specimens in my collection, given to me by my good friend M. Jules Verreaux himself.

Fam. MUSCICAPIDÆ.

36. BIAS MUSICUS.

Bias musicus (V.); Sharpe, Cat. Afr. B. p. 43.

"Cameroons Mountains, February 23rd, 1871."

A male in full plumage. *Megabias* seems to me to be scarcely generically separable.

37. PLATYSTEIRA LEUCOPYGIALIS.

Platysteira leucopygialis, Fras.; Sharpe, Cat. Afr. B. p. 43.

"Eye blue."

Mr. Crossley has sent several specimens of this bird, procured on the Cameroons Mountains, between the 18th of January and the 27th of February.

38. PLATYSTEIRA CYANEA.

Platysteira cyanea (Müll.); Sharpe, Cat. Afr. B. p. 44.

An old male, and a young male just throwing off the plumage of the adult female.

39. TERPSIPHONE TRICOLOR.

Terpsiphone tricolor (Fras.); Hartl. Orn. W. Afr. p. 44.

Mr. Crossley has sent a fine series of this Flycatcher, procured between the 21st of January and the 5th of February, 1871.

40. TERPSIPHONE MELAMPYRA.

Terpsiphone melampyra (Verr.); Sharpe, Cat. Afr. B. p. 44.

Two specimens procured on the Cameroons Mountains on the 16th of February, 1871. This species appears to me to be clearly characterized, the absence of white on the wing being the distinguishing peculiarity. I have a fine specimen in my collection from Gaboon.

Fam. HIRUNDINIDÆ.

41. PSALIDOPROCNE NITENS.

Psalidoprocne nitens (Cass.); Sharpe, P. Z. S. 1870, p. 291.

"Cameroons Mountains, January 16th, 1871."

Until recently this species was known only from Gaboon, where it was discovered by Du Chaillu, one of whose original specimens is now in my collection. Governor Ussher has lately sent it from Fantee, and the discovery of the bird in Cameroons shows that it is found in all the countries round the Bight of Biafra.

Fam. LANIIDÆ.

42. DRYOSCOPUS LEUCORHYNCHUS.

Dryoscopus leucorhynchus, Hartl.; Sharpe, Cat. Afr. B. p. 47.

"Cameroons Mountains, February 1st and March 8th, 1871. Iris brown."

Two specimens, both with black bills.

43. LANIARIUS HYPOPYRRHUS.

Laniarius hypopyrrhus (Verr.); Sharpe, Cat. Afr. B. p. 49.

"Cameroons Mountains. Iris grey."

One specimen, agreeing exactly with the bird from Fantee sent by Mr. Ussher.

44. LANIARIUS MULTICOLOR.

Laniarius multicolor, Gray; Sharpe, Cat. Afr. B. p. 48.

A specimen of a particoloured Shrike from the Cameroons Mountains is sent by Mr. Crossley, which considerably puzzled me for some time; but I have at last referred it to the present species. The upper surface of the body is precisely similar to other specimens in my collection from Fantee; but underneath the Cameroons bird has none of that fiery crimson which characterizes the last named examples, but is everywhere of a beautiful orange. I presume it may be a female.

45. NICATOR CHLORIS.

Nicator chloris (Val.); Sharpe, Cat. Afr. B. p. 49.

"Cameroons, February 2nd, 1871."

Fam. ORIOLIDÆ.

46. ORIOLUS BRACHYRHYNCHUS.

Oriolus brachyrhynchus, Sw.; Sharpe, Cat. Afr. B. p. 54.

Four specimens, collected on the Cameroons Mountains between the 8th and 21st of February. I have no doubt that I was right in joining *O. baruffi* to *O. brachyrhynchus*, as I did in my 'Catalogue,' and not separating them as in my paper on the African *Oriolidæ* (Ibis, 1870, p. 227), though I expressed my doubts as to their specific distinctness on the last-named occasion.

Fam. LAMPROTORNITHIDÆ.

47. LAMPROCOLIUS PURPUREICEPS.

Lamprocolius purpureiceps, Verr.; Hartl. Orn. W. Afr. p. 119.

"Cameroons Mountains, January 19th and 20th, 1871. Iris brown."

I had already received this species from Cameroons; but, owing to its being immature and having been preserved in spirits, M. Jules Verreaux and I were unable to identify it properly, and we referred it to *L. cupreocauda* (*cf.* Cat. Afr. B. p. 55).

48. HYPHANTORNIS TEXTOR.

Hyphantornis textor (Gm.); Sharpe, Cat. Afr. B. p. 59.

One specimen, from the Cameroons Mountains.

49. HYPHANTORNIS AURANTIA.

Hyphantornis aurantia (V.); Hart. Orn. W. Afr. p. 121.

"Bonny, November 21st, 1870."

I obtained a short time back two specimens of this Weaver bird from Mr. Higgins, out of an old collection of Du Chaillu's. The bird now sent by Mr. Crossley exactly agrees with these Gaboon examples, and they are certainly referable to the *Malimbus aurantius* of Vieillot (Ois. Chant. pl. 44). But, although these two specimens of Du Chaillu's must have passed through the hands of the late Mr. Cassin in America before they arrived in this country, I am unable to find the species mentioned in any of his lists of Gaboon birds, and I think he may have considered it to be the female of *H. grayi*. I have the hen of this latter bird in my collection; and it is certainly quite distinct from the species now under consideration.

50. HYPHANTORNIS FLAVIGULA.

Hyphantornis grayi, Verr.; Hartl. Orn. W. Afr. p. 122.

"Cameroons Mountains."

Agrees with a female specimen in my collection from the River Volta, but it is more greenish and not so richly coloured.

51. MALIMBUS NITENS.

Malimbus nitens (Gray); Sharpe, Cat. Afr. B. p. 60.

"Cameroons Mountains, January 21st and February 2nd, 1871. Iris red."

52. MALIMBUS CRISTATUS.

Malimbus cristatus (V.); Sharpe, Cat. Afr. B. p. 60.

"Cameroons Mountains, February 7th and 23rd, 1871."

53. MALIMBUS SCUTATUS.

Malimbus scutatus (Cass.); Sharpe, Cat. Afr. B. p. 60.

"Cameroons Mountains, January 31st and February 9th, 1871."

54. MALIMBUS NIGERRIMUS.

Malimbus nigerrimus (V.); Sharpe, Cat. Afr. B. p. 60.

"Cameroons Mountains, January 20th and 21st, and February 4th, 1871.

55. NIGRITA LUTEIFRONS.

Nigrita luteifrons, Verr.; Sharpe, Cat. Afr. B. p. 61.

"Cameroons Mountains."

One adult bird.

56. NIGRITA BICOLOR.

Nigrita bicolor, Hartl.; Sharpe, Cat. Afr. B. p. 61.

"Cameroons Mountains, January 7th, 1871."

The genus *Nigrita* now contains the following species:—

Clavis specierum generis Nigritæ.

a. subtus nigræ.	
a'. fronte nigra.	
a''. major: tectricibus supracaudalibus albicanti-cinereis	1. *canicapilla*.
b''. minor: tectricibus supracaudalibus nigris	2. *emiliæ*.
b'. fronte stramineo-lutescente	3. *luteifrons*.
b. subtus lactescenti-albæ.	
a'. uropygio brunneo, dorso concolori	4. *fusconota*.
b'. uropygio dilute cinnamomeo	5. *uropygialis*.
c. subtus chocolatina	6. *bicolor*.
d. subtus umbrino-cinerea	7. *arnaudi*.

Order ACCIPITRES.

Fam. FALCONIDÆ.

57. ACCIPITER HARTLAUBI.

"Cameroons Mountains, January 16th, 1871."

Above dark blackish brown with narrow and almost obsolete rufous edgings to the feathers; quills blackish brown, with the same obsolete rufous edgings; the under surface of the wing much lighter and inclining to pale rufous, with very distinct black cross bars and tips to the feathers; tail very dark brown, barred across with blackish brown and pale rufous, the outer feathers quite plain, and all the tail-feathers tipped with pale rufous; throat white; rest of the under surface of the body rust-colour, lighter and more inclining to white down the centre of the body, the flanks very distinctly marked with diamond-shaped spots of blackish brown; legs deep rust-colour, with indistinct black transverse bars; under wing-coverts pale rust-colour, with a few blackish spots on the lower feathers and axillary plumes; bill black, yellowish at the gape and base of lower mandible; legs deep yellow, claws black. Total length 13·7 inches, culmen 0·9, wing 7·5, tail 7·4, tarsus 2·3.

Mr. Gurney has very kindly compared my specimen with typical examples in the Norwich Museum; and we came to the conclusion that the bird described is a young male of this species.

Fam. STRIGIDÆ.

58. SYRNIUM NUCHALE.

Syrnium nuchale, Sharpe, Ibis, 1870, p. 487.

"Cameroons Mountains, February 20th, 1871."

Mr. Gurney identifies this as a young bird of the West African *Syrnium* lately described by me. I add a detailed description of the specimen now sent.

Above tawny, all the feathers broadly barred and tipped with downy white, each white band having a margin of dark brown; wing-coverts dark brown, a few of them strongly tinged with rufous and barred with white; quills dark brown, inclining to tawny on the upper surface, especially of the secondaries, which are almost entirely of the latter colour; all the quills more or less strongly marked and barred with dark brown; tail dark brown, inclining to tawny towards the tip and strongly barred with blackish brown; under surface tawny, paler and inclining to fulvous white on the abdomen, which is unspotted, all the breast barred across with white; legs tawny, with tiny marks of brown; under wing-coverts dark rufous, with brown marking. Total length 14 inches, culmen 1·2, wing 9·5, tail 6, tarsus 1·6.

Order GRALLÆ.

Fam. RALLIDÆ.

59. RALLUS OCULEUS.

Rallus oculeus (Tem.); Hartl. Orn. W. Afr. p. 241.

One specimen.

Fam. TANTALIDÆ.

60. IBIS RELIGIOSA.

Ibis religiosus, Sav.; Hartl. Orn. W. Afr. p. 231.

One specimen.

Order ANSERES.

Fam. PODICIPIDÆ.

61. PODICA SENEGALENSIS.

Podica senegalensis (V.); Hartl. Orn. W. Afr. p. 249.

One specimen.

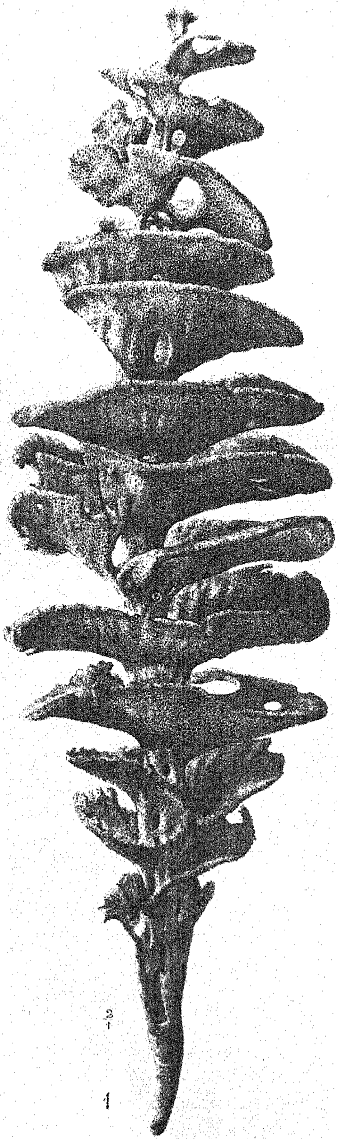
Fam. LARIDÆ.

62. STERNA FISSIPES.

One specimen.

The following is a list of the birds now recorded from Cameroons, including those already described by Mr. George Robert Gray from Capt. Burton's collection:—

1. *Ceryle rudis* (L.).
2. *Alcedo quadribrachys*, Bp.
3. *Ispidina picta* (Bodd.).
4. *Halcyon dryas*, Hartl.
5. —— *cyanoleuca* (V.).
6. —— *senegalensis* (L.).
7. *Berenicornis albocristatus* (Cass.).
8. *Tockus pulchrirostris* (Schl.).
9. *Turacus cristacus* (V.).
10. *Corythrix persa* (L.).
11. —— *meriani*, Rüpp.
12. *Chrysococcyx claasii* (V.).
13. —— *cupreus* (Bodd.).
14. —— *smaragdineus*, Sw.
15. *Zanclostomus flavirostris* (Sw.).
16. *Tricholæma hirsuta* (Sw.).



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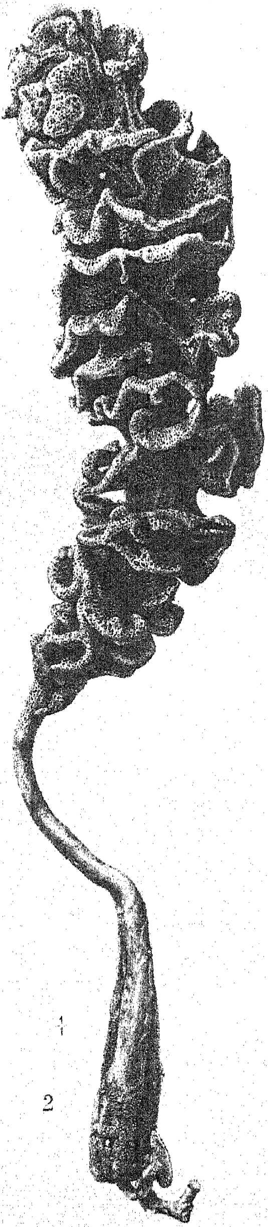

2

New Sponges.

G.H.Ford.

Mintern Bros imp.

17. *Xylobucco duchaillui* (Cass.).
18. *Gymnobucco peli*, Hartl.
19. *Trachyphonus purpuratus*, Verr.
20. *Campethera nivosa* (Sw.).
21. *Alethe castanea*, Cass.
22. *Turdus crossleyi*, Sharpe.
23. *Criniger calurus*, Cass.
24. —— *tricolor* (Cass.).
25. —— *chloronotus*, Cass.
26. —— *tephrolæmus* (Gray).
27. —— *nivosus*, Temm.
28. *Andropadus virens* (Cass.).
29. *Ixonotus guttatus*, Verr.
30. *Cossypha poensis*, Strickl.
31. —— *isabellæ*, G. R. Gray.
32. *Pratincola salax*, Verr.
33. *Nectarinia superba* (V.).
34. —— *fuliginosa* (Shaw).
35. —— *angolensis* (Less.).
36. —— *chloropygia*, Jard.
37. —— *subcollaris*, Reich.
38. *Anthreptes aurantia*, Verr.
39. *Speirops melanocephalus* (G. R. Gray).
40. *Bias musicus* (V.).
41. *Platysteira leucopygialis*, Fras.
42. —— *cyanea* (Müll.).
43. *Terpsiphone tricolor* (Fras.).
44. —— *melampyra*, Verr.
45. *Psalidoprocne nitens* (Cass.).
46. *Dryoscopus leucorhynchus*, Hartl.
47. *Laniarius hypopyrrhus*, Verr.
48. —— *multicolor*, G. R. Gray.
49. *Nicator chloris* (Val.).
50. *Oriolus brachyrhynchus*, Sw.
51. *Lamprocolius purpureiceps*, Verr.
52. *Hyphantornis textor* (Gm.).
53. —— *aurantia* (V.).
54. —— *flavigula*, G. R. Gray.
55. *Malimbus nitens* (J. E. Gray).
56. —— *cristatus* (V.).
57. —— *scutatus* (Cass.).
58. —— *nigerrimus* (V.).
59. *Nigrita luteifrons*, Verr.
60. —— *bicolor*, Hartl.
61. *Euplectes phœnicomerus*, G. R. Gray.
62. *Ligurinus olivaceus* (Fras.).
63. *Strobilophaga burtoni*, G. R. Gray.
64. *Accipiter hartlaubi*, Verr.
65. *Syrnium nuchale*, Sharpe.
66. *Rallus oculeus* (Temm.).
67. *Ibis religiosa*, Sav.
68. *Podica senegalensis* (V.).
69. *Sterna fissipes* (L.).

11. On a new Genus of Sponges from North Australia. By W. Saville Kent, F.Z.S., F.R.M.S., &c., of the Geological Department, British Museum.

[Received June 19, 1871.]

(Plate XLVIII.)

I am indebted to Dr. J. E. Gray for permission to describe the two remarkable Sponges figured in the accompanying plate.

As they agree with one another in their histological and more general fundamental structure, I have no hesitation in regarding them as generically identical, though, in the absence of a published account of any closely approximating form, it becomes requisite to establish a new genus for their reception.

Order SILICEA.

Gen. nov. CAULOSPONGIA.

Sponge consisting of a central stem or axis, around the distal portion of which the sponge-body is disposed in separate whorls, or in more or less regular or irregular spiral convolutions. Skeleton compound, consisting of a primary network of keratose fibre, with siliceous spicula irregularly imbedded in it, and an accessory one of siliceous spicula only. Spicula of one form, simple, spinulate, arcuate.

1. CAULOSPONGIA VERTICILLATA. (Plate XLVIII. fig. 1.)

Sponge-body forming interrupted ascending spiral, or regular and separate infundibular expansions. Central axis and stalk fistulose, the internal cavity frequently communicating with the exterior by means of extensive oscula. Skeleton kerato-siliceous, consisting principally of horny reticulated fibre with siliceous spicula imbedded in it, but having an accessory and superficial one of spicula imbedded in sarcode only. Spicules spinulate, slightly arcuate; average length $\frac{1}{50}$ inch.

Hab. North Australia. Free Public Museum, Liverpool.

2. CAULOSPONGIA PLICATA. (Plate XLVIII. fig. 2.)

Sponge-body forming contorted laminate convolutions, having an irregular ascending spiral direction. Stalk fistulose above the commencement of the body, with numerous oscular passages, compact beneath. Skeleton kerato-siliceous as in the last species. Spicula spinulate, slightly arcuate; average length $\frac{1}{40}$ inch.

Hab. Unrecorded. B.M., presented by Miss Saul.

In the existence of a primary and secondary siliceo-fibrous skeleton, this new genus appears most closely to approach *Diplodemia* of Bowerbank, an incrusting form with simple acerate spicula, regarded by its author as forming a connecting link between the Keratose and Halichondraceous tribes of Sponges.

In the drawing which I exhibit (Plate XLVIII.) fig. 1 represents *Caulospongia verticillata* reduced to one half its natural size, and fig. 2 the true proportions of *C. plicata*. The single specimen examined of the first of these exhibits a series of slightly prominent ridges radiating from the centre to the circumference of the infundibular or spirally ascending expansions of the sponge-body, these being most conspicuous on the upper surfaces. In both species the passages communicating with the internal cavity of the fistulose stem would appear to represent the only distinct oscular system.

12. Notes on some *Arachnida* collected by Cuthbert Collingwood, Esq., M.D., during rambles in the China Sea, &c. By the Rev. O. P. Cambridge, M.A., C.M.Z.S.

[Received May 24, 1871.]

(Plate XLIX.)

A small collection of Arachnida, kindly placed in my hands by Dr. Collingwood after the termination of his rambles in the China Sea, contained the following species, some of which are of considerable interest, and two appear to be undescribed:—

Order Araneidea.

Gasteracantha roseolimbata, Doleschall, "Tweede Bijdrage tot de Kennis der Arachniden van der Indischen Archipel," Acta Societat. Scient. Indo-neerlandicæ vel Verhandelingen der Natuurkundige-Vereeniging voor Nederlandsch Indie, vol. v. 1858–59, p. 43, pl. xiii. fig. 1.—Pratos Reef.

Argiope striata, Doleschall, *loc. cit.* p. 30, pl. ix. fig. 2.—Labuan.

Nephila rivulata, Cambr., n. sp.—Labuan.

Nephila moluccensis, Dol. *loc. cit.* pl. i. fig. 6.—Labuan.

Nephila chrysogaster, Walck. Ins. Apt. tom. ii. p. 92.—Labuan and Manilla. The male of this species is new to science.

Tetragnatha nepæformis, Dol. *loc. cit.* p. 46, pl. xvi. fig. 1.—Kelung, near Formosa.

Uloborus (Orithyia) williamsii, Blackw. Ann. & Mag. Nat. Hist. for Nov. 1858.—Labuan.

Thomisus diana, Savign. Egypte, Arachnides, pl. 7. no. 1, figs. 1, 2.—Aden.

Heteropoda (Olios) leucosia, Walck. Ins. Apt. tom. ii. p. 566.—Labuan.

Salticus citus, Cambr. Zoologist for 1863, p. 8561.—Labuan and Manilla.

Salticus collingwoodii, Cambr., n. sp.—Labuan.

Salticus viridifasciatus, Dol. *loc. cit.* p. 19, pl. iii. fig. 8.—Labuan.

Order Scorpionidea.

Ischnurus complanatus, Koch, Die Arachn. Bd. iv. p. 73, pl. 128. fig. 295.—Labuan.

Lychas maculatus, Koch, Die Arachn. Bd. xii. p. 1, pl. 397. fig. 960.—Pratos Island. 'Rambles of a Naturalist in the China Sea,' by C. Collingwood, Esq., M.D., p. 27.

Also, at Labuan, a fine example of the order Phalangidea, but whose specific identity I have not yet been able to determine.

Descriptions of new Species.

Family EPEIRIDES

Genus NEPHILA, Leach.

NEPHILA RIVULATA, n. sp. (Plate XLIX. figs. 1, 2.)

Female adult, length 12 lines. *Male adult*, 2½ lines.

The *cephalothorax* is elevated before, depressed behind, and prominent at the eyes; it is furnished with short strongish black spine-like bristles, and is of a deep red-brown colour, approaching to black in many examples, especially on the fore part of the caput. The height of the clypeus is equal to one half of the facial space.

The *eyes* are small and vary but little in their relative size; they are situated in four pairs or two slightly curved transverse rows, the curves being directed from each other, and the front row being the least curved of the two; the four central eyes form nearly a square whose foremost side is rather the shortest; the two central eyes of the front row are nearer to each other than each is to the lateral, of the same row, on its side, but the distance between them is, as nearly as possible, the same as that between those of each lateral pair; those of the hinder row are very nearly equidistant from each other.

The *legs* are moderately long, strong, and furnished with hairs and spines; they are alternately and broadly banded with bright yellow and deep reddish brown, except the tarsi and metatarsi, which are yellowish near to the tibiæ, and gradually deepen to a reddish black-brown.

The *palpi* have the humeral joints yellowish and the rest of a deep rich reddish black-brown colour.

The *falces* are long and massive, very prominent towards their base in front, and of a deep rich black-brown, almost black.

The *maxillæ* are similar in colour to the falces, but are edged on their inner sides towards the extremities with yellow.

The *labium* is oblong, rather rounded at the apex; it is about one half the length of the maxillæ; its sides are similar in colour to the falces, the central portion being yellow and somewhat in the form of a double united lozenge or dumb bell.

The *sternum* is of a subtriangular form indented on the margins; it is of a bright yellow colour, irregularly but broadly margined with deep rich black-brown.

The *abdomen* is of a longish oval shape; when looked at in profile it is more elevated before than behind; it is large and projects over the base of the cephalothorax; the upperside is almost entirely occupied by a long, somewhat oval, dull whitish-yellow marking, more or less obscured with brown; this marking is dentated on its edges, and from each outer prominent point (as well as from each side of its foremost extremity) a somewhat sinuous yellowish-white line or band issues and traverses the side of the Spider (which is of a dull brown colour) quite to the underside; these lines have rather a backward direction, and are connected by some short parallel horizontal irregular lines of the same colour; in many examples, especially immature ones, the large long oval marking mentioned above contains within it a much narrower one defined sometimes by a dark black-brown dentated line on either side, sometimes by a light yellowish-white one. In some instances the space within this interior marking is darker than that outside it; in other instances it is of the same hue. The underside is dull brown, with six large spots or blotches of yellow or orange (and in one or two examples almost red); these blotches are arranged in two parallel longitudinal rows of three each, the four anterior ones being very conspicuous, the other two (near the spinners) not so conspicuous; of the four anterior ones the two nearest to the spiracles are much the largest. The epigyne is corneous and of a deep rich brown-black colour; it consists of a long narrow transverse opening much constricted in the middle.

The *male* is very small in comparison with the female; the legs are long and strongish, except the tarsi and metatarsi, which are slender; they are armed with longish black spines, and are of a deep brown-black colour, except near the base of the femoral joints, which (together with the exinguinal joints) are of a reddish yellow. The cephalothorax is of a bright reddish-yellow colour; and the *abdomen*, which is somewhat similar but of a yellower hue, is of a flattish oval form, and has on the upperside a shining corneous case- or shield-like appearance, but little marking is visible, except a largish sort of brown cloud towards the hinder part.

The *palpi* are of a dull orange-yellow colour, not very long, but strong; the cubital and radial joints are short; the latter are rather the stoutest, they have no marked projections at their extremities, but are furnished with a few black bristles; the digital joints are large, and the palpal organs are also large and prominent and of a very peculiar form, consisting of a nearly globular shining reddish corneous lobe, on the surface of which are some darker sinuous lines; from the extremity of this lobe there projects a long, strong, somewhat corkscrew-shaped, nearly black, sharp-pointed corneous spine, with a strongish prominence near its sharp point; the length of this corkscrew-spine almost equals (if it does not exceed) the length of the whole palpus, and presents a very formidable appearance; it is probably intended for use in adhering to the female in the act of copulation. In *Neriëne nigra* (Bl.), the male of which has a smaller but somewhat similar spine connected with its palpal organs, I once found this portion so firmly fixed in the vulva (or epigyne) of the female as to be incapable of extrication without fracture; in several instances the male of *Nephila rivulata* had lost the whole digital joint and palpal organs attached; and I have but little doubt that the loss was occasioned by the impossibility of extrication without fracture, from the female, owing to the firm fixing of this corkscrew-appendage in the epigyne.

This Spider, which is nearly allied to *Epeïra malabarensis*

(Walck.), has a wide range; I have received the female from Natal, and the same sex in abundance also from Minas Geraes, Brazil, where they were captured by Mr. Henry Rogers. Messrs. J. Nietner and G. H. K. Thwaites have also sent me many examples from Ceylon; and among those received from Mr. Thwaites were the only males I have yet seen. Dr. Collingwood's collection contained numerous individuals captured at Labuan, but all females. It is evidently a *Nephila*, although the abdomen has not the long cylindric form of the typical species; the great dissimilarity in the size of the male and female also connects it with all the *Nephilæ* whose males are yet known.

NEPHILA CHRYSOGASTER (♀), Walck. (Plate XLIX. figs. 3, 4.)

Female adult, length 20 to 24 lines. *Male adult* (n. sp.), length 2 to 2½ lines.

This species belongs to Walckenaër's group *Tuberculatæ*, characterized by two small pointed tubercles on the cephalothorax. The male has never (as far as I am aware) been yet described; its cephalothorax, legs, falces, maxillæ, labium, and sternum are of a brightish orange-yellow colour, the tibiæ, tarsi, and metatarsi of the legs deepening into a dark brownish yellow, and the normal indentations of the cephalothorax are marked with dusky yellow-brown. The *abdomen* is of a very cylindric-oval form, slightly tapering towards its posterior extremity; the upperside, where it is slightly paler in colour than the cephalothorax, has a glossy corneous appearance, and is marked with a longitudinal median tapering line or narrow band of a brownish-yellow hue, on either side of which, towards the fore part, are two dots of the same colour; the sides are marked above with a pale yellowish longitudinal band followed by a parallel brown line, below which are some indications of oblique brown lines on a pale yellowish ground; the underside is pale yellowish irregularly marked with brownish lines; the hinder extremity of the abdomen is strongly suffused with blackish. The *legs* are long, especially those of the first pair, the extra length being in the metatarsi, which, with the tarsi, are slender; they are furnished with hairs and (chiefly on the femora and tibiæ) with longish but slender black spines. The *palpi* are paler in colour than the legs, except the digital points and palpal organs, which deepen into blackish brown; they are short, especially the radial and cubital joints, the former of which is a little produced on the upper fore side; the digital joint is large and comprises the palpal organs, which are large and prominent; they are corneous and of a nearly globular form, with a prominence beneath near their hinder extremity; and a long, rather slender, sharp-pointed, tapering black spine issues from their fore extremity, pointing downwards and slightly backwards; this spine equals, if it does not exceed, the whole length of the palpus, and gives the palpal organs somewhat the look of a Snipe's skull and beak.

Adults of both sexes of this Spider were received in 1868 from Dr. Collingwood, who found them in abundance both at Labuan and Manilla. Some time after, I also received both sexes from Mr.

Thwaites from Ceylon. Dr. Collingwood, in his most interesting 'Rambles in the China Sea,' p. 189, remarks upon a small Spider which he commonly found in the webs of the large *Nephilæ*, and which, from its small size, he naturally concluded to be of some other species, whose food appeared to be the remains of the larger one's prey. On perusing this account it seemed to me almost certain that the small Spider must be the male of the larger one; and this opinion was afterwards confirmed by the reception of examples of both the large and small Spiders from Dr. Collingwood, as well as from Mr. Thwaites, who also found them inhabiting the same web, and concluded from this and other circumstances that, in spite of the great difference in size, they were the two sexes of the same species.

Perhaps few points of sexual dissimilarity are more curious than this extreme difference in size between the males and females of this genus, the male being scarcely (in the present instance) more than one-tenth of the length of the female; it seems to me fairly accounted for by an application of a branch of the principle of "sexual selection." It is the known habit of the female in some Epeïrids to endeavour to destroy or devour the male, and M. Vinson, in his work on the Spiders of the Mauritius, speaks of this habit in reference to a species of this genus. M. Vinson gives a very graphic account of the agile way in which the diminutive male escapes from the ferocity of the female, by gliding about and playing hide and seek over her body and along her gigantic limbs: in such a pursuit it is evident the chances of escape would be in favour of the smallest males, while the larger ones would fall early victims; thus gradually a diminutive race of males would be "selected," until at last they would dwindle to the smallest possible size compatible with the exercise of their generative functions—in fact probably to the size we now see them, *i. e.* so small as to be a sort of parasite upon the female, and either beneath her notice, or too agile and too small for her to catch without great difficulty.

Family SALTICIDES.

Genus SALTICUS (Bl.).

SALTICUS COLLINGWOODII, n. sp. (Plate XLIX. fig. 5.)

Female adult, length 2½ lines.

The *cephalothorax* (which is of ordinary form) is of a bright reddish yellow-brown colour margined by a narrow band of bright shining silvery hairs; the upper part of the caput is darker than the rest, and is clothed with short yellowish-grey hairs, and a patch or short transverse band of bright scarlet ones between the two posterior eyes.

The *eyes* are in the ordinary position—those of the third row (the two smallest of the eight) being *within* the straight line of those of the second and fourth rows, and nearer to those of the latter respectively than to the former.

The *falces* are moderate in length and strength, a little projecting and slightly divergent at their extremities; they are of a dull yellow-brown colour.

The *legs* are rather short, moderately strong, and their relative length appears to be 4, 1, 2, 3, there being very little, if any, difference between those of the second and third pairs; they are of a brownish-yellow colour striped with longitudinal lines of black, and silvery shining white hairs, and are armed with a few inconspicuous spines.

The *abdomen* is of a short oval form; two-thirds of the upperside forwards are of a bright scarlet, marked conspicuously in front and on the sides by a broad irregular margin of dove-coloured grey tinged with olive-green; two large somewhat oval patches of the same colour occupy the centre of the scarlet portion, and are connected with the front border by a narrow line or neck of a similar hue; this pattern is edged narrowly with black; the hinder extremity of the abdomen is black, divided from the scarlet fore part by a broad, shining, silvery-white transverse band, which is also divided from the scarlet by a slender black line. The spinners are prominent, of a dull white colour, with a broad black transverse band in the middle of the superior pair; the underside of the abdomen is of a silvery shining white colour, reflecting rich metallic tints in a strong light, and margined behind with black; all the above colours on the abdomen are formed by a short close-set covering of hairs or pubescence.

A single adult female of this beautiful *Salticus* was contained in the collection under consideration, and was found at Labuan; it is, I believe, new to science; and it gives me great pleasure to connect with it the name of Dr. Collingwood, who has enabled me to give the above report on the Spiders collected by him.

DESCRIPTION OF PLATE XLIX.

Fig. 1. *Nephila rivulata* (Cambr.), p. 618.
  a. Female, natural size.
  b. Spider in profile, without legs.
  c. Underside.
2. *Nephila rivulata*, p. 618.
  a. Male, natural size.
  b. Palpus of male, magnified.
3. *Nephila chrysogaster* (Walck.), p. 620.
  a. Male, natural size.
  b. Palpus of male, magnified.
4. *Nephila chrysogaster*, p. 620.
  Female, natural size.
5. *Salticus collingwoodii* (Cambr.), p. 621.
  a. Female, magnified.
  b. Profile, without legs.
  c. Cephalothorax, from above.
  d. Natural size.

November 7, 1871.

Professor Newton, V.P., in the Chair.

The Secretary read the following reports on the additions to the Society's Menagerie during the months of June, July, August, and September, 1871:—

The total number of registered additions to the Society's Menagerie during the month of June 1871 was 132, of which 42 were by birth, 43 by presentation, 39 by purchase, and 8 were received on deposit. The total number of departures during the same period, by death and removals, was 130.

Among the additions the more remarkable were:—

1. Two Turtle-doves from Aldabra Island, an atoll lying between Madagascar and the Seychelles, presented to the Society by Mr. Edward Newton, C.M.Z.S., Colonial Secretary, Mauritius, June 10th. These Doves belong to the group containing *Turtur picturatus* and its allies, but differ specifically from any of them that I have previously seen. The colour above is nearly uniform vinous, growing more plumbeous towards the tail. The postcervical markings are very indistinct; there is no white on the throat.

These characters nearly agree with those attributed by Bonaparte (Consp. ii. p. 62) to *Turtur prevostianus*. If the locality there given ("the Mariannes") is, as is possible, erroneous, they may be referable to that species. As a temporary designation for them, however, I propose the name *Turtur aldabranus*.

2. A Nisnas Monkey (*Cercopithecus pyrrhonotus*, Ehr.) from Southern Nubia, presented by Col. the Hon. P. Fielding, June 16th. Of this eastern representative of the well-known Patas (*C. ruber*) I am not aware that we have ever previously received a living specimen.

3. Two examples of a fine large species of Tortoise of the genus *Platemys*, from the fresh waters of the Argentine Republic, presented by our active correspondent Mr. Geo. Wilks, of Buenos Ayres, June 17th. Prof. Burmeister (La Plata-Reise, ii. p. 521) has referred the ordinary Terrapin of that country to *Platemys hilarii*; but, as Dr. Peters has recently shown*, this supposed species has been based upon young specimens of *P. geoffroyana*, Schweigg., to which species the present specimens also undoubtedly belong.

4. Three young Eagles from Southern Spain, presented by Major Howard Irby, June 24th. These birds are in exactly the plumage lately described by Mr. Howard Saunders before this Society† as being characteristic of this bird in Spain. Their arrival at this time is most opportune, as it gives us an opportunity of comparing them with the young Chinese Imperial Eagle, of the arrival of which I have already spoken in my report for May last (see *anteà*, p. 545).

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* Monatsber. Berlin, 1870, p. 311 (May 12).

† See *anteà*, p. 37.

Major Irby informs me that these Eagles were taken from the nest near Coto del Rey, about twenty miles from Seville. They were hatched about the third week in April of the present year, and were brought to Major Irby in the down.

5. A second specimen of the Tamandua Ant-eater (*Tamandua tetradactyla*), probably from Brazil, purchased of a dealer in Liverpool, June 27th. This animal appears to present well-marked points of difference from the Santa-Marthan specimen, acquired May 29th[*]. It is not possible to make an accurate comparison of these animals while alive; and I shall therefore beg leave to defer my remarks on this subject to a future occasion.

The total number of registered additions to the Society's Menagerie during the month of July 1871 was 98, of which 9 were by birth, 48 by presentation, 10 by purchase, 2 by exchange, and 29 were received on deposit. The total number of departures during the same period, by death and removals, was 100.

The more remarkable arrivals were as follows:—

1. Three Daubenton's Curassows (*Crax daubentoni*, G. R. Gray) from Tucacas in Venezuela[†], presented July 11th by Mr. A. Warmington, who has kindly favoured me with the following notes on them:—

"The three Curassows (one male and two females) were captured at 'Maron,' near Tucacas, N. Venezuela, and at the present time are nearly two years old, having been taken from the nest when scarcely larger than a chicken of two months old. They soon became perfectly tame and would follow me about. When able to fly they made short flights, always returning quickly, and seldom alighting. At night they invariably roosted on the highest spot they could find in the home Corāl. They are called by the natives 'Porū.' Their cry is a sort of mournful prolonged whistle, and in the forest, when eight or ten are together, has a singular effect. It is not common to see these birds on the ground. When they alight in a tree they almost invariably utter their cry, and at the same time raise the tail-feathers fan-like, thus exposing the white plumage beneath, and offering a conspicuous and tempting mark for the sportsman. They are excellent eating. I have never heard of these birds breeding in confinement, though I cannot say they do not. The young ones are exceedingly beautiful delicate little creatures, marked very much like, and having a very similar appearance to, young Partridges or Quails. They become much attached to individuals who treat them kindly. These birds are common in all parts of Venezuela where there is a forest. The other, or blue-knobbed species[‡], is not so common, and is more difficult to domesticate."

2. A collection of Ceylonese animals, brought home on his return from Ceylon and presented to the Society by Mr. E. W. H. Holds-

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[*] See *anteà*, p. 546, Pl. XLIII.

[†] I have already noticed the arrival of this species from the same locality (P. Z. S. 1870, p. 671). *Cf.* also Scl. et Salv. P. Z. S. 1870, p. 516.

[‡] *Pauxi galeata*, see P. Z. S. 1870, p. 520.—P. L. S.

worth, F.Z.S., July 17th. It embraces examples of the following species, mostly new to the Society's collection:—

1 Paddy-field Deer (*Cervus porcinus*, var.).
1 Cheela Eagle (*Spilornis cheela*).
2 Ceylonese Spur-fowl (*Galloperdix ceylonensis*).
4 Indian Crows (*Corvus splendens*).
1 Russell's Viper (*Vipera russelli*).

3. An example of the Long-nosed Crocodile of Western Africa, *Crocodilus* (sive *Mecistops*) *cataphractus*, purchased July 19th. I am not aware that we have ever before possessed living individuals of this very distinct and unmistakable Crocodilian.

4. Six Dorsal Squirrels (*Sciurus dorsalis*, Gray), purchased July 20th. We have placed these and some previously acquired examples of this beautiful species in one large cage together, and have great hopes that they will breed with us. The clever sketch by Mr. Keulemans, which I now exhibit, will serve to show the great variations in colour to which this species is subject.

The total number of registered additions to the Society's Menagerie during the month of August 1871 was 122; of these, 10 were by birth, 34 by presentation, 47 by purchase, 5 by exchange, and 26 were received on deposit. The total number of departures during the same period, by death and removal, was 91.

The most noticeable of the additions were:—

1. A third specimen of the Tamandua Ant-eater (*Tamandua tetradactyla*), probably from Brazil, obtained by purchase August 7th, and agreeing generally in external characters with the specimen purchased on June 27th.

2. Two Bonteboks (*Damalis pygarga*), purchased August 11th, being the only examples of this beautiful Antelope that have reached us for the last twenty years*.

3. Two Peruvian Thicknees (*Œdicnemus superciliaris*, Tsch.),

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* Mr. E. L. Layard gives me the subjoined note concerning this Antelope:—

"The Bontebok is very nearly exterminated, and, but for the fostering care of the Messrs. Breda and Van der Byl would be quite so in a couple of years.

"They are confined to the extreme south of the continent of South Africa, to a portion of country called the 'Strand Veldt.' It is an extensive flat, bordered by the sea on the south-west, south, and south-east, and by a range of undulating country or low hills rising to the Caledon Ranges and Zwart Bergen on the northern side. It is, in fact, the nearest plateau to the L'Agulhas bank, and is called 'Cape L'Agulhas.' The whole of this country belongs chiefly to the families of Breda and Van der Byl; and they preserve the animals as much as they can. A Government permit is also required to shoot them, which must be visa'd by the magistrate at Bredasdorp, the name of the village on this range of land.

"They are, however, poached and destroyed by one or two small holders, who have small patches of land surrounded by the large properties, and who refuse all offers of purchase, and plant corn on purpose to tempt the animals into it, and then at night shoot them. They roam in herds of about eight or ten, or twenty; but sometimes fine old bucks are found solitary. They are usually shot from a cart, which they will suffer to approach them, or from horseback. If wounded and approached they will charge desperately; and I have heard of a Hottentot being killed by them thus."

presented by the Baron de Rivière August 14th. The distinctness of this species from *Œ. bistriatus*, the best-known and only other American form of this genus, has recently been confirmed by myself and Mr. Salvin (Exot. Orn. p. 59, pl. xxx.) ; but the present bird is very little known, and the receipt of living specimens of it is a fact of much interest.

4. Three specimens of a Land-tortoise of the genus *Cinixys*, which seem to be referable to Home's *Cinixys* (*Cinixys homeana*, Bell). These Tortoises were brought home by H.E. Governor Ussher on his recent return to this country, and presented by him and Staff-Surgeon Mosse jointly to the Society, along with some fine specimens of *Vipera rhinoceros* and *Vipera nasicornis*. Of Home's Cinixys Mr. Ussher gives me the subjoined particulars:—

"Tolerably common in Fantee and the Aura districts, where it forms an article of food with the natives, who prize it much on this account, and who therefore do not usually offer it for sale. It appears to live for a very long time in the water, one of those brought home by me having existed some months in a tank of water."

5. A young male specimen of Baird's Tapir (*Tapirus bairdi*) from Nicaragua, purchased August 15th, being the first example of this newly discovered Mammal that has yet reached us. Dr. Gray (P. Z. S. 1867, p. 885, pl. xlii.) has introduced into the illustration a figure of the immature form of this species from a photograph sent to me by Capt. Dow; but the colour (not having been given in the original photograph) is not quite correct. Mr. Verrill, however, has published an accurate description of the young in 'Silliman's American Journal' (vol. xliv. p. 126; *cf.* Ann. Nat. Hist. ser. 3, vol. xx. p. 232). Mr. Smit's figure (Plate L.), which I now exhibit, shows the condition of our specimen soon after its arrival. It did not live long in the Society's Gardens, I regret to say, and died September 27th.

6. A specimen of the singular little mud-inhabiting fish of New Zealand, being an aberrant form of the family *Galaxiidæ*, recently described by Dr. Günther (Ann. Nat. Hist. ser. 3, vol. xx. p. 305, pl. vii.) as *Neochanna apoda*, presented August 18th by the Acclimatization Society of Canterbury, New Zealand. Unfortunately it did not live long in our Gardens, and I now exhibit the specimen in spirits.

7. Two Frigate or Man-of-War Birds (*Fregata aquila*), which arrived August 28th, having been forwarded to us by our excellent friend and correspondent Capt. John M. Dow, F.Z.S., who is always on the look-out for something that may prove acceptable to the Society's collection. Five individuals of this species, Capt. Dow informs me, were captured by him on 23rd of July last, during a visit to an island in Fonseca Bay, which contains a well-known breeding colony of this fine bird*. The two specimens that have reached us are both in the white-headed plumage of immaturity.

The total number of registered additions to the Society's Menagerie during the month of September 1871 was 138; of these, 7 were by birth, 45 by presentation, 27 by purchase, 49 by exchange, and

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* See Mr. G. C. Taylor's account of it in 'Ibis,' 1859, p. 150.

10 e received on deposit. The total number of departures during th me period, by death and removal, was 124.

e most noticeable of the additions were:—

A Javan Fish-Owl (*Ketupa javensis*, Less.), purchased Sep-ber 8th, being the first example of any species of this well-marked us of Owls obtained by the Society.

2. A young specimen of the South-American Flamingo (*Phœnicopterus igni-palliatus*), received September 19th by one of the Brazilian Mail-steamers from Buenos Ayres, and believed to have been forwarded to the Society by our energetic correspondent Mr. George Wilks of Buenos Ayres.

3. An Iguana, presented September 19th by Mr. J. B. Rowe. Mr. Rowe obtained this animal from a seaman, who stated that he had brought it from the Chincha Islands. But Dr. Günther, who has examined it, refers it to *Metopoceros cornutus*, Wagler, of St. Domingo.

4. A young Cassowary, obtained by exchange from the Zoological Society of Amsterdam, September 20th. This bird, which is stated to have been captured by a missionary resident at Munsinam, near Havre Dorey, on the north-west extremity of the Bay of Geelvink, New Guinea, in the summer of 1869, appears to me to be identical with the bird described by Rosenberg as *Casuarius kaupi* (J. f. Orn. 1861, p. 44). Dr. Schlegel has referred this species to the young of *C. uniappendiculatus* (see P. Z. S. 1866, p. 168). But I can hardly believe our bird to be the same as the latter species, there being no traces at present of any throat-wattle at all, and the size being so much smaller. Our bird seems to belong to a species closely allied to *C. bennetti*, but quite distinct.

5. A young female Ibex from the Island of Crete, presented to the Society September 30th by T. B. Sandwith, Esq., H.B.M. Consul for that island. Blasius refers the Cretan Ibex to *Capra beden*, under which name I have provisionally entered our specimen in the Register. It is, however, apparently quite different from the female Ibex from Crete received in 1862, which reared a numerous hybrid progeny in the Gardens; and I am not yet certain as to its correct specific name*.

Mr. Sclater exhibited, on behalf of the Viscount Walden, President of the Society, skins of both sexes of a new and most interesting Falconine bird of the genus *Polihierax*, which had been recently obtained in the vicinity of Tongoo, in Upper Burmah, and transmitted to Lord Walden by Major Lloyd.

In this species, which Lord Walden was intending to describe and figure under the name *Polihierax insignis*, the whole of the back of the head in the female sex, as well as the upper back, was of a deep chestnut, being in the male grey striated with black. In both sexes the white plumage below was marked on the neck and breast with black shaft-stripes. The tail was black, broadly barred with white, and very much rounded, the outer rectrices being more than an inch and a half shorter than the middle. The total length of the tail of the female was 10¼ inches, of the wing 6.

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* In 1868 Mr. Blyth exhibited a head and horns of this Ibex at a Meeting of this Society, but did not give any name to the species (see P. Z. S. 1868, p. 262).

The following extracts were read from a letter addressed to the Secretary by Dr. J. Anderson, F.Z.S., Director of the Indian Museum, Calcutta, dated June 17th, 1871:—

"I have received a specimen of a short-tailed *Macacus* from Bhamô unlike any Monkey I know, but more allied to *M. nemestrinus* than to *M. leoninus*. It is a hill Monkey. I first became acquainted with the species in the hills to the east of Bhamô and obtained a specimen, which I sent down to Bhamô to wait my return from Yunan. When I got back to Bhamô I was told that the Monkey had died and had been buried. About a year and a half after my visit to Bhamô a Mr. Stewart, from Rangoon, visited it and brought away the specimen that is now in my possession, and which exactly resembles the specimen I sent to Bhamô from the Kakyen hills—so much so, indeed, that I am inclined to the belief that my lost pet has been restored to me. The following is its description:—

"MACACUS BRUNNEUS, sp. nov.

"Body short and stout; head rather large; limbs short, stout, and powerful; hands and fingers short, the latter rather full and much like those of *Simia*. The fingers are very sparsely clad, covered on their flesh-coloured upper surfaces with a few longish greyish-yellow hairs, which are more numerous on the toes. The terminal phalanges of each extremity are nude. The face is reddish flesh-coloured, the tint being most intense round about the eyes. The centre of the upper eyelid transversely has a bluish tint, the remainder being red. The muzzle is short, moderately pointed, and abruptly truncated. The lips are moderately full, and the chin is rather bulging. The nose is but slightly prominent, and marked at its apex by a vertical, longitudinal fine groove. The eyes are large [illegible] ression, as in *Simia satyrus*. The face is much wrin[illegible]ly. Ear rather large, with an almost rounded outline, b[illegible] with a small rather pointed projection posteriorly at the junction of the posterior and superior margins; it is quite nude on its posterior surface, and with only a few straggling greyish-yellow hairs on its outer aspect. Fur long, thick, and woolly, longest on the back (2⅜ inches), shoulders, limbs, and shortest and most dense on the sacral region. Chin and throat almost bare. Hair sparse on the chest and abdomen. A single flesh-coloured callosity below the tail triangular in form, the apex of the triangle being placed downwards; greatest transverse breadth 2 inches, greatest length 2 inches. The hair on the head is parted longitudinally down the centre on the anterior half of the head above the bridge of the nose, the hair being directed outwards on either side. General colour dark brown, darkest on the head, rump, and arms, paler on the sides of the head and on the under surface and on the feet, in which localities it is washed with yellowish.

	inches.
"Length along side from snout to root of tail	14$\frac{2}{8}$
Tail	1$\frac{2}{8}$
Length of anterior extremity	11
——— of humerus	3$\frac{3}{8}$
——— of radius	5$\frac{2}{8}$
——— of middle finger	2$\frac{1}{8}$
——— of hinder extremity	12$\frac{1}{8}$
——— of femur	5
——— of tibia and fibula	4$\frac{3}{8}$
——— of middle toe	2$\frac{1}{8}$
——— of thumb (three phalanges)	1$\frac{3}{8}$
——— of great toe (three phalanges)	2
——— of hind foot	4$\frac{6}{8}$
——— of hand	3$\frac{3}{8}$
Tip of snout to anterior margin of ear	3$\frac{6}{8}$
Girth round occiput and over mouth	13$\frac{3}{8}$
Posterior angle of eye to anterior margin of ear	2$\frac{5}{8}$
Internal angle of eye to anterior extremity of nasal septum	1$\frac{2}{8}$
Breadth across nostrils	$\frac{5}{8}$
——— between eyes	$\frac{4}{8}$
Girth round muzzle halfway between [illegible]	[illegible]
Transverse length of eye	$\frac{6}{8}$
Occipital protuberance to anterior ridge (superciliary) of frontal	5$\frac{5}{8}$
Breadth across molars	3
Girth round arm below elbow	5
—— round chest ½ inch below nipple	12$\frac{3}{8}$

"This Monkey is very gentle and docile; and its manners strongly recall to me those of an Orang I once had for nearly a year in my possession."

In a subsequent communication (dated Calcutta, September 27th) Dr. Anderson enclosed some photographs of the same Monkey, and stated that he had received a second specimen of the same species from Cachar. This was younger than the former, but differed only in its smaller size and lighter-coloured fur. From information recently received, Dr. Anderson believed that it would be found that this Monkey was not uncommon in the hilly parts of Assam, and doubtless extended thence to the eastern banks of the Irrawaddy.

Mr. Sclater called the attention of the Meeting to the reported existence in Northern Queensland of an undescribed animal of about the size of a Dingo (*Canis dingo*), of which no specimen had yet been obtained by naturalists. In reply to some inquiries on this subject lately addressed to Mr. Brinsley G. Sheridan, Police Magistrate of Cardwell, Rockingham Bay, Queensland, Mr. Sclater has received the following letter, dated August 2nd, 1871:—

"Sir,—I fear you must have misunderstood Mr. Arthur Scott about my son having been attacked by some unknown ferocious animal in the bush. It was simply this. One evening strolling along a path close to the shore of Rockingham Bay, a small terrier, my son's companion, took a scent up from a piece of scrub near the beach, and followed, barking furiously, towards the coast-range westwards. My boy (thirteen years of age, but an old bushman, who would put half those described in novels to the blush) followed and found in the long grass, about half a mile from the spot the scent was first taken up, an animal described by himself as follows:—'It was lying camped in the long grass and was as big as a native Dog; its face was round like that of a Cat, it had a long tail, and its body was striped from the ribs under the belly with yellow and black. My Dog flew at it, but it could throw him. When they were together I fired my pistol at its head; the blood came. The animal then ran up a leaning tree, and the Dog barked at it. It then got savage and rushed down the tree at the Dog and then at me. I got frightened and came home.'

"It was just dark when the boy came home in a high state of excitement and told me the story. From inquiry I find that this is not the first time a similar animal has been seen in this neighbourhood. Tracks of a sort of Tiger have been seen in Dalrymple's Gap by people camping there, and Mr. Reginald Uhr, now Police Magistrate at St. George, whilst one of the native mounted police officers in this district, saw the same animal my son describes. The country is so sparsely populated, and the jungles (or, as we call them here, 'scrubs') so dense and so little known, that I have no doubt that animals of this kind exist in considerable numbers, the abundance of food and their timidity preventing our more intimate knowledge of their habits. I shall be most happy to send you, should it be my good fortune to drop across one of them, its skin and skeleton. I only regretted, as my poor boy did, that he had not my revolver, as he says he stood, when it was fighting with the Dog, at less than a yard from the animal."

A letter was read from Mr. Gerard Krefft, dated Sydney, April 19th, 1871, in which, after stating that the skeleton of *Dioplodon seychellensis*, lately added to the Australian Museum (see P. Z. S. 1870, p. 426), has "the usual seven cervical vertebræ, four of which are free, the last bearing a short quadrangular piece of bone 1½ inch long by 1 inch broad; nine dorsals bearing ribs, five of which join on to the sternum, which consists of four pieces; and twenty-nine lumbar and caudal vertebræ," he adds, "I have been fortunate enough to obtain the skeleton of a second small Whale, evidently closely allied to the *Mesoplodon sowerbiensis*, figured by MM. Van Beneden and Gervais (Ostéographie des Cétacés, pl. xxii.). This animal had been stranded at Little Bay, between Botany Bay and Long Bay, distant six or seven miles from Sydney. The carcass was much cut, and I had the greatest difficulty in obtaining the missing fragments of bones. The head fared very badly, and was almost completely destroyed; but, thanks to the energy and skill of our articulator Mr. Henry Barnes, it has been so far restored that a tolerably correct idea may be formed of its original shape. The lower jaw was very much broken; there appeared no teeth above the gum; but after removing the flesh I found a very curious looking tooth in its alveolus, the points of which penetrated the bone on either side. The number of cervicals is three anchylosed and four free. Nine pairs of ribs, and a very small pair which appear to have no attachment. Five of the ribs join on to the sternum, which consists of five pieces. The lumbars and caudals amount to twenty-nine, with nine V-bones attached to them. The pectoral limb is of moderate size, bearing four fingers, with five, five, four, and three joints respectively. The number of carpal bones is six."

Photographs of the skeleton, which accompanied Mr. Krefft's letter, were exhibited.

Professor Flower stated that, as far as could be ascertained from the photographs, the skull of the new specimen agreed so closely with that described by Gray under the name of *Ziphius layardii* (P. Z. S. 1865, p. 358) that he believed that they should be referred to the same species, the differences of development of the teeth being probably due to the influence of sex or age. He trusted that before long Mr. Krefft would furnish the Society with an accurate and detailed description of this very interesting skeleton.

Professor Flower, F.R.S., read a memoir on the classification of the Ziphioid Whales (*Ziphiinæ*), which he regarded as a subfamily of the *Physeteridæ*[*], and in which he proposed to recognize four genera, namely *Hyperoodon*, *Ziphius*, *Mesoplodon*, and *Berardius*. To this was added a complete description of a skeleton of *Berardius arnouxi*, which had lately been received from New Zealand by the Museum of the Royal College of Surgeons, through Dr. J. Haast, F.R.S.

This paper will be printed in the Society's 'Transactions.'

The following papers were read:—

1. Additional Remarks on certain Species of Pelicans. By P. L. Sclater, M.A., F.R.S., Secretary to the Society.

[Received October 4, 1871.]

(Plate LI.)

In May, 1868, I had the honour of reading before the Society some notes on the Pelicans, principally based upon the observation of the specimens of these birds living in the Society's collection[†].

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[*] *Cf.* Trans. Zool. Soc. vi. p. 113.

[†] See Proc. Zool. Soc. 1868, p. 264 *et seq.*

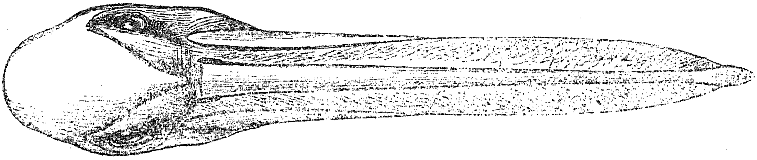
Since that date, Mr. D. G. Elliot has contributed to our 'Proceedings' his "Monograph of the genus *Pelecanus*"*, and Prof. Barboza du Bocage has favoured us with the description of a new species of this genus†. I have now a few additional observations to offer to the Society, partly supplementary to my previous notes, and partly in reference to the communications of Mr. Elliot and Prof. Barboza du Bocage on this subject.

1. PELECANUS ONOCROTALUS.

The Syrian Pelican received from Mr. E. T. Rogers in February, 1868 (of which I spoke, P. Z. S. 1868, p. 265), is now quite adult, and agrees so nearly with the two fine examples of *P. onocrotalus* which have been in the Society's Gardens for the last twenty years that there can be no doubt, I think, that I was correct in my determination of this bird.

Next to *P. onocrotalus* and *P. minor* must be placed Prof. Barboza du Bocage's new *P. sharpii* (described P. Z. S. 1870, pp. 173, 409), of which fine species I have now the pleasure of exhibiting one of the typical specimens belonging to the Lisbon Museum. In structure this bird, as has already been pointed out by its describer, approximates closely to *P. onocrotalus*. The angular projection of the frontal feathers (see fig. 1) corresponds very nearly to what is seen in the last-named species. But the brilliant colouring of the chest and belly, which is quite different from any thing which I have ever seen in *P. onocrotalus*, and the absence of a pendent crest renders the species easily distinguishable.

Fig. 1.



Upper surface of bill of *P. sharpii*, one fourth the nat. size.

Last summer, when inspecting the bird-galleries of the Museum of the city of Strasburg, under the guidance of Dr. Schimper, I found a fine example of *P. sharpii* in the excellent series of Pelicans there exhibited. Prof. Schimper had not determined the specimen, and was not quite certain about its locality.

Mr. Smit's figure (Plate LI.) represents the typical specimen at one seventh of the natural size, and will serve, I trust, to make this fine species better known.

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* Proc. Zool Soc. 1869, p. 571.

† *Pelecanus sharpii*, described Proc. Zool. Soc. 1870, p. 173 and p. 409. See also Jornal de Scienc. Lisbon, 1871, no. xi.

2. Pelecanus mitratus sive minor (*l. s. c.* p. 266).

One of our specimens of this Pelican, received from Calcutta in 1867, is still living in the gardens, and is now in adult plumage.

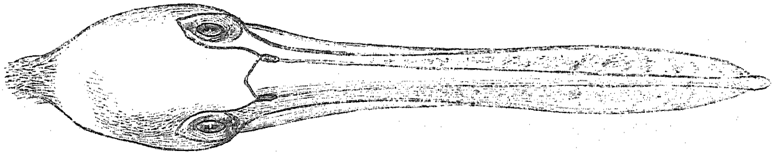
A skin in Mr. Swinhoe's collection from Foochow is, in my opinion, referable to this species, and not to *P. onocrotalus* (as already stated by Mr. Swinhoe, P. Z. S. 1871, p. 420). It is therefore probable that *P. javanicus* of Horsfield may be identical with this bird.

Rüppell (Mus. Senckenb. ii. p. 185) states that the Senckenburg Museum contains several examples of this Pelican from Moldavia, where it is found in company with *P. onocrotalus*. In the Strasburg Museum I likewise found a stuffed specimen of this species from the Danube; so that there can be little doubt of its occurrence in Southern Europe.

3. Pelecanus rufescens (*l. s. c.* p. 267).

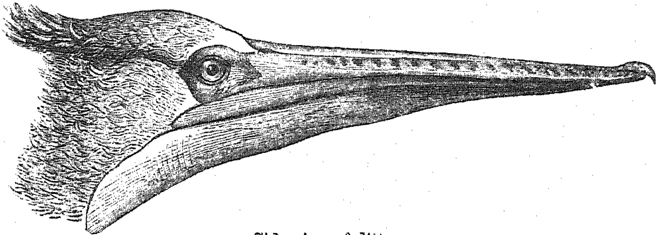
One of our specimens of this Pelican (the bird purchased in May 1861, and figured P. Z. S. 1868, pl. xxvi.) has now (Oct. 2nd, 1871) for the first time acquired perfect plumage, and is exactly as is represented by Rüppell (Zool. Atlas, *Aves*, pl. 21). A short nuchal crest has developed itself; and a rosy-reddish colour covers the lower back. This is no doubt the full nuptial plumage, and will probably only last a few weeks.

Fig. 2.



Upper surface of bill of *P. philippensis*, one fourth the nat. size.

Fig. 3.



Side view of ditto.

Mr. Elliot (P. Z. S. 1869, p. 586) unhesitatingly unites *P. philippensis* to *P. rufescens*. In my previous notes, I gave it as my opinion that these two species are distinct, although nearly allied (P. Z. S. 1868, p. 269). Prof. Barboza du Bocage (Jorn. de Scienc.

de Lisboa, 1871, no. xi. p. 174), in discussing this question, is likewise favourable to regarding them as distinct, "si les deux rangs de taches brunes régulièrement imprimées sur la mandibule supérieure se retrouvent constamment chez les individus de Malacca, de l'Inde, de Cochinchine, de l'Asia enfin, tandis qu'elles ne se présentent jamais chez ceux d'Afrique."

Besides the skins of *P. philippensis* in Capt. Beavan's collection from Burmah, of which I have already spoken*, I have recently examined two obtained by the late Dr. Maingay in Malacca, one in Mr. Swinhoe's collection from Swatow, China, and one from India in the Strasburg Museum. In all these specimens the above-mentioned dark spots on the upper mandible (see figs. 2 & 3, p. 633) are well developed, while nothing of the kind is visible in our living examples of *P. rufescens*, either adult or young. I am therefore still more confirmed in my view that the African and Asiatic birds must be kept distinct.

There appear to me therefore to be now ten well-determined species of *Pelecanus*, viz. :—

†1. *P. onocrotalus*, from S. Europe and N.E. Africa.
†2. *P. minor*, from S. Europe, Africa, and S. Asia.
3. *P. sharpii*, from W. Africa.
†4. *P. crispus*, from S. Europe and N.E. Africa.
†5. *P. rufescens*, from Africa.
6. *P. philippensis*, from S. Asia.
7. *P. trachyrhynchus*, from Mexico and Western N. America.
†8. *P. conspicillatus*, from Australia.
9. *P. fuscus*, from Central America.
10. *P. molinæ*, from Chili.

Besides these, I have seen two specimens of Pelicans in the Strasburg Museum, which appear to me (as likewise to its excellent custos Dr. Schimper) to indicate the existence in the highlands of Columbia of an undescribed species of the genus allied to *P. fuscus* and *P. molinæ*, but peculiar for its long, solid, and very much compressed beak. These specimens are both in immature plumage, and are labelled as having been received from Bogotá in 1847. It would be of great interest to discover the adult of this Pelican.

2. Remarks on Indian Fishes.

By Francis Day, F.Z.S., F.L.S.

[Received September 27, 1871.]

Having only just obtained the 'Zoological Record' for 1869, I have been ignorant up to the present time that the identification of several species of fishes made by me in the 'Proceedings' of this Society for 1869 has been disputed by Dr. Günther. Premising that it has never been my wish to defend any determination of species whenever their incorrectness becomes apparent, still I consider it but reasonable to show my correctness when it has been erroneously called into question.

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* *Anteà*, 1868, p. 269.

† Of these species we have examples now living in the Society's collection.

SERRANUS LANCEOLATUS.

S. horridus, C. et V.

It is unfortunate that the drift of my observations, made in the P. Z. S. 1869, p. 512, have been so misunderstood by the Recorder, my intention having been to show that Blyth's *Serrani* which he considered to exhibit the adult livery were identical with what I likewise held to be the mature form, both of us having arrived at the same conclusion from distinct sets of specimens, collected in different localities. I consequently held that my original statements had been erroneously called into question in the 'Fishes of Zanzibar.'

The presence or absence of cæcopyloric appendages is entirely a secondary consideration, apart from the main one, which is, Are Mr. Blyth's species and mine identical or not? And I most distinctly showed them to be so.

Genus EUTROPIICHTHYS.

Dr. Günther states, in the 'Record,' that I have "thought proper to create the impression as if the Recorder had overlooked those teeth," viz. those on the palate, my remark being *his own words*, in inverted commas, thus, "no teeth on the palate;" and Dr. Günther in his article continues that, "having received an example from Colonel Playfair some years ago, the Recorder has found the palatine teeth." *Where was this fact recorded*? He remarks, "Mr. Day was well aware that no specimens were available for examination at the time when the generic diagnosis was compiled." This, however, is also an error, as I knew nothing respecting the various collections of fishes Dr. Günther had examined.

PSEUDEUTROPIUS TAAKRE, Sykes.

I identified *Hypophthalmus taakree* as *Pseudeutropius*, to which Dr. Günther demurs, observing, "The position of the barbels in the figure given by Sykes indicates a *Eutropius*, and not a *Pseudeutropius*, a circumstance left unexplained by Mr. Day." However, Sykes has published no figure showing the inferior surface of the head in this fish, but merely a *side view* (Trans. Zool. Soc. ii. pl. 64, f. 4), from which I question whether any one could decide whether the barbels are or are not in a transverse line. Sykes says "they are arranged two and two;" but as they exist in pairs on either side of the chin, this statement gives no assistance at arriving at the true facts.

However, I think, all this can be explained. Sykes described two species of *Hypophthalmus*, *H. taakree* and *H. goongwaree*, and placed his typical specimens in the collection of the Zoological Society, which was subsequently transferred to the British Museum. Neither of Sykes's typical specimens, however, find a place in the 'Catalogue of Fishes in the British Museum,' in which the latter is considered a *Pseudeutropius,* and the former a *Eutropius,* although Sykes placed them in one genus.

Having been courteously permitted by Dr. Günther, in 1870, to examine *Pseudeutropius longimanus,* Günther (stated in the Catalogue to be "*a.* Skin, 6 inches long: not in good state. India. From the collection of the Zoological Society"), I was surprised to find *it was one of Sykes's specimens,* a fact overlooked when the Catalogue was compiled. Attached to it was the following label:—"940. Zool. Soc.," and *Hypophthalmus goongwaree* (13–6–/57), evidently a transposition of labels from the *H. taakree.*

Before I had seen this skin, I had identified Sykes's fish with Dr. Günther's, and published this fact in the Proc. Zool. Soc. 1869, p. 617. I question whether the genus *Eutropius* has any representative in India. Hamilton Buchanan's *Pimelodus murius,* considered by Dr. Günther a doubtful *Eutropius,* is, I am convinced, identical with *Pseudeutropius megalops,* Günther. Thus the existence of the genus *Eutropius* in Hindostan rests upon two specimens, 3 inches long, in the British Museum, labelled "India," a locality having a wide range in the opinion of some zoologists.

In remarking that I do not adopt his genus *Tylognathus* in my papers in the Society's 'Proceedings,' Dr. Günther observes I do not explain how I am able to maintain *Labeo* as distinct from *Barbus* without this intermediate division. Definitions will be found pretty accurately given in the 'Catalogue of Fishes in the British Museum,' wherein a wide difference, amongst others, is shown between the mouths of *Labeo* and *Barbus,* whilst *Tylognathus* has its "mouth essentially formed as stated in *Labeo*" (p. 62).

Respecting my identification of *Crossochilus rostratus,* Günther, with *Cyprinus bata,* Hamilton Buchanan, the following occurs at p. 135:—"[Mr. Day is evidently again too hasty in this identification. First, Hamilton Buchanan's fish has more than nine branched dorsal rays (a character the value of which Mr. Day will by-and-by learn to appreciate), his description and MS. drawing agreeing in this respect. Secondly, without attempting to say what Mr. Day's fish may be, it cannot be *Crossochilus rostratus,* as the latter has a pair of upper barbels only, but no maxillary barbels (provided Mr. Day knows how to distinguish between these two kinds of barbels).]"

Leaving unnoticed personalities, as irrelevant to scientific discussions, wherein facts are the subjects in question, I pass on to the Recorder's statements, into which, I think, some error has found entrance, as *neither Buchanan's description nor figure coincides with the text of the 'Record.'* Hamilton Buchanan, at p. 283, observes of the *C. bata,* "with twelve rays in the fin of the back. * * * The first ray of the dorsal fin is short, and closely united with the second, which, like it, is undivided." Deducting two unbranched rays from the total twelve, we have ten branched ones remaining.

If the last is divided to the root, some observers, as Hamilton Buchanan and Bleeker, count it as two; others, as Dr. A. Günther, consider it, and, I believe, correctly so, only one. Of these ten branched rays, H. Buchanan observes, "the last of them being divided to the root." Deducting one from ten, I see no other result possible than nine, or nine branched rays. Turning to the *original* drawing, in the library of the Asiatic Society of Bengal, there are only nine branched rays, *counting the last divided to its root as one*; consequently my statement was perfectly accurate, whilst Dr. Günther, failing to determine Hamilton Buchanan's species, which he considered to have ten branched dorsal rays, placed it as a *Cirrhina**, thus affording an excellent illustration of the untrustworthiness of arbitrarily splitting species into genera, solely because of the existence of nine or ten branched rays in the dorsal fin. As regards *Crossochilus rostratus*, Günther, from the description as now given, it appears to resemble *Cypr. bata*, H. B., excepting in having a pair of rostral instead of a pair of maxillary barbels, the species being defined from a single immature specimen 4 inches in length.

Dr. Günther likewise observes (*l. c.* p. 136) that, having found *Barbus sophore*, H. B., in the Calcutta Museum without any label, I had "nevertheless supposed it to be the type of the species, *l. c.* p. 376." This, however, being inaccurate, may be a misprint; for I *do not use the term "type" at all.*

In the 'Record' (p. 127), Dr. Günther states that Hamilton Buchanan's "drawings exist in triplicate, one copy being in the British Museum." At p. 136, he continues respecting my remarks, P. Z. S. 1869, p. 373:—"*Barbus beavani.* Mr. Day thinks that this might be *Cyprinus chagunio* (H. B.), *l. c.* p. 373 [but a fish described as having large scales and minute barbels is not likely to be *B. beavani*]."

Amongst Hamilton Buchanan's original drawings one of *C. chagunio* exists, and is labelled as such; it is 9½ inches in length, and is a very fair representation of the species. The drawing gives forty-one scales along the lateral line, only six less than exist in nature. The rostral barbels are delineated as long as the eye, and the maxillary slightly longer. In the 'Catalogue of Fishes in the British Museum,' Dr. Günther placed "? *Cyprinus chagunio*, Ham. Buch.," as a doubtful synonym of *Barbus clavatus*, wherein he gives forty-two scales to the lateral line, and "barbels well developed."

There are several omissions in the 'Record;' but on them I do not propose offering any remarks, as they are mostly concerning facts or determinations wherein I differ from those given in the British-Museum Catalogue.

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* The genus *Crossochilus*, as defined by Günther, has "dorsal fin without osseous ray, with not more than nine branched rays;" the existence of ten would cause the fish to become a *Cirrhina*, according to the Catalogue (at least, as this species was erroneously considered to have such, it is under that genus), which, however, is defined as "dorsal fin without osseous ray, with from thirteen to seventeen rays." Now if the *C. bata* had ten branched ones and two unbranched ones, or a total of twelve, I cannot see how it comes to be included in either, as the definition of the genera would have to be altered or a new one created for its reception.

3. On the Habits of the Horned-nosed Viper (*Vipera nasicornis*). By HERBERT TAYLOR USSHER, C.M.Z.S., Administrator of the Government, Gold Coast.

[Received August 1, 1871.]

Having lately kept specimens of *Vipera nasicornis* in captivity, I think that a few notes on their habits may not be uninteresting. The first I had was a female, which I ultimately despatched along with two males to this Society; but Mr. Blissett, who took charge of them to England, has since informed me that the female died on the voyage. She was at first very sluggish, and I could scarcely get her to move. One afternoon I went on to the terrace where her cage was kept at Government House, and found the whole place swarming with young ones. I carefully watched the process of parturition, and found that the young snakes came from the mother in a sort of skin; this, however, they speedily rubbed off, and at once crawled away in various directions. From this circumstance I am led to infer that the mother does not care for her offspring, and that they at once commence to shift for themselves. I gave away many of the young ones, which numbered twenty-one in all, to various persons, some to Mr. Blissett. Their colours were peculiarly beautiful, especially the lance-shaped mark on the head, which was like black velvet. They were very venomous little creatures, one of them biting a mouse and killing it in five minutes: this, too, on the day it was born.

The adult male is distinguished from the female by its brighter colours. She is much darker and more grey, although I think generally larger than the male. After the young were born the female above referred to became very ill-tempered, and when the two males were placed in her cage she turned round and bit one with great violence, leaving one of her fangs about three-quarters of an inch in length sticking in his back. He, however, appeared not to suffer the slightest inconvenience and was never the worse for it.

When striking their prey these Serpents seize it with great rapidity and firmness, and appear to shake it as a terrier would a rat. A puppy died in a minute and a half after the stroke, although only bitten in the ear; a chicken only lived about ten seconds!

These reptiles are common in the Fantee country, but are rarely seen, as they fly at the approach of man.

Since then I have observed a fine specimen of *Vipera rhinoceros*, which is likewise found in the neighbourhood of Cape-Coast Castle, seize and devour its prey. As soon as the rat (a full-sized one) was placed in its cage, it seized it across the body as a Jack would a Roach, pressing its fangs deeper and deeper into the animal, and never relaxing its hold, even when the rat died. It then, with extreme caution, without withdrawing its hold, worked the head towards its mouth, and gradually swallowed the prey in short "gulps" or bolts. Five or six persons watched the process in perfect silence, which did not appear to incommode or annoy the snake.

4. Descriptions of eight new Australian Land-Shells. By JOHN BRAZIER, C.MZ.S.

[Received October 11, 1871].

1. HELIX (HADRA) DARWINI.

Shell umbilicated, depressedly globose, very thin, finely granulated and radiately striated; spire moderately elevated, obtuse; whorls 5, slowly increasing, convex, last roundly convex, slightly descending in front, dirty yellow; base convex, sculptured the same as the upper surface; umbilicus rather small, deep; aperture diagonal, ovately lunate; peristome very little reflected, white; margins approximating and joined by a thin callus, columellar margin reflected and half covering the umbilicus.

Diam. maj. 7, min. 5½, alt. 4 lines.

Hab. North coast of Australia (*coll. Brazier*).

I received two specimens of this species from a friend who collected them in the far north of Australia; but the precise locality was not sent with them. It is allied to *Helix forsteriana*, Pfr., from North-east Australia.

2. HELIX (HADRA) STEPHENSONIANA.

Shell umbilicated, turbinately globose, somewhat pellucid, of a fine straw-colour, faintly and obliquely striated, rather puckered at the suture; spire subconoid; whorls 5½, moderately convex, last convex and inflated, deflected in front; base convex; aperture oblique, lunately circular; peristome light pink, straight; margins approximating, upper margin rather thickened and expanded, columellar margin arcuate and reflexed, covering half the umbilicus, which is deep and moderately large.

Diam. maj. 9, min. 7½, alt. 6 lines.

Hab. Port Denison, Queensland, North-east coast of Australia (*coll. Brazier*). Rare.

This species is of a fine straw-yellow colour on the last whorl, the other whorls being nearly white; the lip is of a light pink colour. I only know of one specimen, which is in my own cabinet.

3. HELIX (HADRA) BENNETTI.

Shell umbilicated, depressedly globose, very thin, finely rugosely striated and minutely granulated, dark-yellowish horny; spire rather conoid, obtuse; whorls 6, moderately convex, rapidly increasing, last convex and inflated in front, slightly descending; umbilicus large, deep, and slanting; aperture oblique, lunately ovate, interior of aperture of a bright flesh tinge; peristome simple, white, straight; margins approximating and joined by a thin callus, right margin dilated, columellar margin broadly expanded and reflected, covering one third of the umbilicus.

Diam. maj. 8, min. 6½, alt. 5 lines.

Hab. Ipswich, Queensland, inland 50 miles from Brisbane: rare (*coll. Brazier*).

I possess two specimens of this species, which approaches near to *H. prunum*, Fér., from Port Darwin and Port Essington, also to *H. greenhilli*, Cox, from the Dawson River. I have named it with great pleasure in honour of Dr. George Bennett, F.L.S., whose indefatigable exertions in the cause of science have made us acquainted with many new and rare specimens of natural history from Australia and the Polynesian Islands.

4. HELIX (TRACHIA) ENDEAVOURENSIS.

Shell umbilicated, depressed, rather thin, very closely, regularly, and finely striated, shining, pale horny; spire rather prominent; suture slightly impressed; whorls 5½, moderately convex, last roundly convex, inflated and deflexed in front; base convex and striated the same as the upper surface; umbilicus rather wide and deep; aperture oblique, lunately ovate; peristome thickened and reflected, tinged with flesh-colour; margins approximating, right margin expanded, thin, straight, columellar margin reflected a little over the umbilicus.

Diam. maj. 7, min. 5, alt. 3½ lines.

Hab. Endeavour River, north coast of Australia (*coll. Brazier*).

There is only one specimen of this species that I know of, and in my collection; it is of a much larger size than *H. torresiana*, Homb. et Jacq., and the sculpture is also very fine, whereas in the species of the French authors the sculpture is coarse.

5. HELIX (CAMÆNA) AUREEDENSIS.

Shell umbilicated, depressedly globose, rather solid, very finely obliquely striated, and, under the lens finely granulated, dark chestnut; suture ornamented with a fine white thread, and also a broad dirty white undefined zone round the umbilicus; spire broadly conoid, obtuse; whorls 6 to 6½, convex, the five upper whorls of a reddish chestnut, the last increasing in size, rounded and deflected in front; base convex; aperture diagonally ovately lunate, brownish white within; peristome straight, ivory-white, slightly thickened and reflected; margins approximating, right margin expanded, columellar margin arcuate and reflexed, concealing nearly half of the umbilicus, which is deep.

Diam. maj. 1½, min. 1¼, alt. 1 inch.

Hab. Aureed Island, Torres Strait, North coast of Australia (*coll. Brazier* and *Hargraves*).

This species I have seen in some of the Australian collections labelled as a variety of *H. incei*, Pfr., but *H. incei* has no white thread-like line at the suture as in the present species.

6. Helix (Hygromia) bednalli.

Shell perforated, rather conoidly globose, very thin, fragile, obliquely rugose at the upper part, granulated under the lens, subdiaphanous, light horny green, with a fine reddish ring encircling the suture, and a rather broad one of the same colour encircling the perforation; spire conoid, somewhat obtuse; whorls 5 to 5½, moderately convex, the last very much inflated, rounded; base convex, much smoother than the upper surface; aperture obliquely lunar, rather large; peristome thin, of a pinkish colour; margins distant, right expanded, columellar margin reflected and covering one quarter of the perforation.

Diam. maj. 8, min. 6½, alt. 5 lines.

Hab. Near Adelaide, South Australia (*Waterhouse* and *Bednall*; in *South Australian Museum* and *coll. Brazier*).

This species I received from my two friends Messrs. Waterhouse and Bednall, under the name of *Helix adelaidæ*, Pfr. The *Helix adelaidæ* is a small depressed species, keeled, and with the umbilicus perspective. *Helix bednalli* I have compared with some hundreds of *H. grayi*, Pfr., and *H. jervisensis*, Quoy and Gaimard, and find sufficient characters to warrant it to rank as a distinct species. The note sent by Mr. Waterhouse with his specimens states that it is a species very rarely obtained in a good state of preservation.

7. Helix (Charopa) subdepressa.

Shell umbilicated, depressed, nearly discoid, thin, closely covered with fine silky striæ, the interstices under the lens with still finer striæ, rather oblique, shining white; spire flat, suture channelled; whorls 5½, rather convex, last angled and descending in front; umbilicus wide, rather perspective, and rounded at the bottom, equalling more than half of the diameter; basal whorl convex, with striæ the same as on the upper surface, and running into the umbilicus; aperture nearly vertical; peristome simple, acute, triangularly ovate; margins distant, right straight, slightly expanded, columellar margin not reflected.

Diam. maj. 1½, min. 1, alt. ½ line; diam. of umbilicus ¾ line.

Hab. Snowy River, Gipps Land, Victoria (*Mr. W. Kershaw*; *coll. Brazier*).

This interesting little species is pure white, and is found in the snowy Australian region that divides New South Wales from Victoria.

8. Bulimus (Liparus) kershawi.

Shell imperforate, ovate, thin, diaphanous, shining, dark yellowish brown, marked with numerous longitudinal and irregular dark yellow and brown lines, some broad and some very narrow, rather running one into the other; and under the lens are to be seen longitudinal and transverse small granulations; spire moderately conical, rather obtuse at the apex; suture crenulated; whorls 5, convex, the last inflated, equalling more than one half of the length of the whole shell; aperture broadly ovate, interior bluish white; peristome simple, acute, straight, thin, the anterior and outer margins arched; columella straight, nearly vertical above, slightly expanded and reflected, with a thin deposit of callus on the columellar side, and joined at the upper part of the peristome.

Length 2, breadth $1\frac{1}{8}$, alt. 1; aperture $1\frac{1}{4}$ long, breadth $\frac{5}{8}$ inch.

Hab. Snowy River, Gipps Land, Victoria (*Mr. W. Kershaw*).

This fine species I have named in honour of its discoverer, Mr. W. Kershaw of Victoria, to whom I am indebted for a specimen. It approaches in appearance to *B. larreyi*, Brazier, and *B. atomatus*, Gray. It differs from those species in not having the dark spots and zigzag lines that are so characteristic in them.

5. Description of a new Species of Fruit-Pigeon from the Fiji Islands. By JOHN GOULD, F.R.S.

[Received November 7, 1871.]

The beautiful bird which I have now the pleasure of exhibiting to the Meeting, and which I propose to call *Chrysœna victor*, is the second species of the genus, of which *C. luteovirens* is the type. For the loan of one of the two specimens exhibited I am indebted to Mr. James Gardner of Oxford Street, and for the use of the other to the Trustees of the Derby Museum at Liverpool, through the kind intercession of their Curator Mr. T. J. Moore. The latter specimen is so similar to the former in colouring and general appearance as to induce the belief that the two birds are of the same age and adult males. How evident it is, from the discovery of this extremely conspicuous and beautiful Pigeon, that the acquisition of new species is not yet at an end, and that such islands as those composing the Fiji group, and hundreds of others dotted over the Polynesian region, will yet afford ornithological and other treasures of natural history which have not as yet met the gaze of civilized and scientific men!

I append a description of this new species, and shall take an early opportunity of publishing a copy of the drawing now shown of the London and Liverpool birds in one of my publications—the 'Birds of Asia,' or the 'Supplement to the Birds of Australia.'

CHRYSŒNA VICTOR, Gould.

Size. About, or perhaps a trifle larger than, that of *C. luteovirens*.

Colour. The entire surface of the body, both above and below, a lovely carmineous-orange, while the head and throat, as if in direct contrast to the brilliant colouring of the body, is of a dull silvery pea-green; under surface of the wings rich pure yellow, the primaries becoming orange on the upper surface of their outer webs, and their shafts dark olive above.

Total length 7 inches; bill $\frac{3}{4}$, wing $4\frac{1}{4}$, tail $2\frac{1}{2}$, tarsi $\frac{3}{4}$.

The female and young will probably be green, as in the case of *C. luteovirens*; at least I find a stray feather or two of that colour on each side of the body of the London specimen.

Mr. Moore, to whom I am indebted for many kind attentions, has favoured me with the following note respecting this lovely species:—

"The bird I now send was obtained by Mr. Thomas Binns Robson of New Brighton, Cheshire, during his visit to the Fiji Islands in September 1867, and was presented by him to the Derby Museum on his return to England. Mr. Robson was so good as to give me the following information respecting it:—The native name is *Buli ndamu*. It appears to be not infrequent in the locality where he shot it, Mbua, a native town and missionary settlement on the south-west of the Island of Vanua Levu, and the principal place of resort in that district. He described it in glowing terms as appearing, from its gorgeous colouring, 'like a flash of light,' even at the distance of a quarter of a mile! Its note resembles somewhat the cracking of the thumb and finger; and the natives by resorting to this expedient induce the birds to answer, and thus to betray their whereabouts when out of sight. Mr. Robson could not give me any information respecting its nest and eggs, nor of its food, except the general fact that it feeds on berries.

"The singular and remarkable plumage of the bird at once attracts attention, the entire body being of a rich orange-colour, as bright as that of the Rock-Manakins (*Rupicolæ*); while the head is of a green hue, and the under surface of the wings fine yellow."

PS. Since the above remarks were in type, Mr. Sclater has forwarded to me the following note:—"Dr. Eduard Gräffe has already spoken of the existence of this bird, in his article on the Ornithology of Polynesia, in Cabanis's 'Journ. f. Orn.' 1870, p. 418. Dr. Gräffe saw a specimen of it living in a cage at Levuka, Ovalau, belonging to an English lady." Thus it is evident that this Pigeon is capable of domestication; and we may therefore hope that ere long living examples may be sent to this country.

6. Description of a new Volute and Twelve new Species of Land-Shells from Australia and the Solomon Islands. By J. Cox, M.D., C.M.Z.S.

[Received November 6, 1871.]

(Plate LII.)

VOLUTA (AMORIA) AUSTRALIÆ, sp. nov. (Plate LII. figs. 1, 1 *a*.)

Shell fusiform, rather thin; spire short, acuminated, apex erect, finely papillary; whorls smooth, 5½, the last angled round the upper part; columella strongly four-plaited, prominent and thin; sutures vitrified; aperture rather long and narrow, lip simple, interior of aperture of a deep orange-red, columella light; colour reddish orange, conspicuously ornamented throughout the whole length of the whorls, especially the last, with dark chestnut (almost approaching to black) lightning-like markings, two or three of which are broad, bifurcated above, and shaded off at the edges, others are in thin linear zigzag streaks.

Length 2·45, breadth 1·05 of an inch.

Hab. Bass's Straits.

I have described this fine species, at the request of Mr. Richmond Thatcher, from a fine specimen handed to me by him. This will make the third species of Volute which this gentleman has brought to light.

PARTULA PEASEI, sp. nov. (Plate LII. fig. 2.)

Shell deeply and openly umbilicated, ovately conical, very broadly inflated towards the base; spire short, broadly conical; whorls 5, convex, last rapidly increasing in size and inflated; suture impressed; aperture squarely ovate, obliquely produced, lip and columella white, thickened, and broadly reflected, interior of aperture orange-red; covered with a striated dark chestnut epidermis.

Length 0·94, breadth 0·70 of an inch.

Hab. Solomon Islands (*Rainbird*).

I have named this in honour of Mr. Harper Pease of Honolulu.

BULIMUS SELLERSI, sp. nov. (Plate LII. fig. 3.)

Shell rimately umbilicated, fusiform, thin, smooth, longitudinally finely striated, and transversely very minutely obsoletely striated towards the apex, apex granularly punctate; opaque, diaphanous, shining, an impure white colour; spire acutely turreted, apex obtuse; whorls 5, the last equalling two-thirds the length of the shell, suture submargined; aperture oblong, white within; peristome margined with a dense white, opaque, flat, porcellaneous margin very slightly everted; columella dilating into two pillars, one inserted and gradually lost on the last whorl, the other spirally entering the aperture as a prominent thin plate.

Length 1·90, breadth 0·66 of an inch.

Hab. Gaudalcanar Island, Solomon Islands.

Evidently belonging to the same group as *B. miltocheilus*, Reeve. Among the many specimens obtained I find no important variation.

HELIX ANDERSONI, sp. nov. (Plate LII. fig. 4.)

Shell imperforate, rather thin, depressedly globose, finely striated, yellow-brown, with three or more rather narrow dark chestnut bands round the centre and lower part of the body-whorl, and one beneath the suture; whorls 6½, almost flat, gradually increasing in size; aperture diagonal, elongately lunately rounded, lip dark, as is also the covered umbilicus; margins converging, thin, slightly expanded, columellar margin triangularly dilated, adnate, occluding the umbilicus and sunk below the marginal line of the aperture, causing the latter to be sharply angled.

Diam., greatest 1·34, least 1·10; height 0·80 of an inch.

Hab. North end of Expedition Range, Rockhampton, Queensland, Australia (*Anderson*).

This species in its general aspect closely resembles *Helix yulei*, Pfr.; but from many fine specimens collected by Mr. Anderson I find it unvarying in its characters, of which the occluded umbilicus is most conspicuous.

HELIX SCANDENS, sp. nov. (Plate LII. fig. 5.)

Shell narrowly umbilicated, turbinately globose, of a dull reddish-yellow colour, thin, transparent, above finely striated throughout, smoother below and shining; whorls 5½, gradually increasing in size, convex, last not keeled; aperture broadly lunate; peristome simple, thin, columellar margin white and opaque, triangularly dilated over the umbilicus.

Diam., greatest 0·13, least 0·11; height 0·09 of an inch.

Hab. Port Macquarie, east coast of Australia, 6 feet from the ground on the trunk of a tree.

HELIX KEMPSEYENSIS, sp. nov. (Plate LII. fig. 6.)

Shell very minute, perforate, globosely conical, thin, pale horny yellow, (microscopically) striated; spire obtuse, conical; whorls 5, slightly convex; aperture lunately oval; peristome simple, thin, margins approached, columellar margin slightly dilated and everted over the narrow umbilicus.

Diam., greatest 0·04, least 0·03; height 0·03 of an inch.

Hab. East Kempsey, MacLeay River, east coast of Australia; found under leaves on wet ground.

HELIX MACQUARIENSIS, sp. nov. (Plate LII. fig. 7.)

Shell broadly, openly, and deeply umbilicated, flatly depressed, thin, transparent, very shining, glossy, yellow, striated above with rather irregular coarse lines of growth, below smoother and finely spirally striated, faintly rayed with broad chestnut-coloured markings; whorls 4½, rapidly increasing at the last, rather flat and margined at the suture; apex scarcely raised; aperture almost round, slightly lunate; peristome blunt and darkened, margins closely approached, columellar margin not expanded.

Diam., greatest 0·14, least 0·11; height 0·06 of an inch.

Hab. Port Macquarie, east coast of Australia; under leaves on damp ground.

HELIX GUADALCANARENSIS, sp. nov. (Plate LII. fig. 8.)

Shell imperforate, trochiform, rather solid, finely obliquely arcuately striated, pale yellow-brown, ornamented with broad or narrow dark chestnut lines, sometimes almost absent; spire turbinate; whorls 5½, slightly convex, the last rather inflated, not descending in front; aperture large, very oblique, irregularly lunately rounded, inclining to be angled at the periphery of the body-whorl; peristome white, porcellaneous, broadly expanded, margined with black externally at the angle of reflexion; margins approached, columella dilated, adnate.

Diam., greatest 1·00, least 0·80; height 1·08 of an inch.

Hab. Guadalcanar Island, Solomon Islands.

The characters of this species correspond very closely with those given by Pfeiffer to *Helix flexilabris*; but I consider there are sufficient points of distinction to regard it as a new species; it is a less conical shell, and the last whorl is much more inflated.

HELIX SELLERSI, sp. nov. (Plate LII. fig. 9.)

Shell imperforate, trochiform, brownish yellow, generally ornamented with two very dark chestnut, almost black, bands, more or less wide, one above and one below the subcarinated periphery of the last whorl, having sometimes between them an opaque white band; transversely rather regularly striated backwards, decussated from behind forwards by rather irregular, slightly waved, proportionally broadly separated striæ, more distinct on the last two whorls than at the apex of the spire; whorls 5, rounded, gradually increasing in size, suture impressed, last whorl sharply depressed at its termination and flattened from the periphery to its insertion; spire obtuse; aperture ovately lunate; peristome white-margined, slightly everted; columella very slightly dilated and adnate.

Diam., greatest 0·78, least 0·56; height 0·60 of an inch.

Hab. Guadalcanar Island, Solomon Islands.

HELIX COMPLUVIATUS, sp. nov. (Plate LII. fig. 10.)

Shell with a very narrow, deep umbilicus, discoid, flat above, rounded below; spire only slightly raised, covered with a glossy corneous epidermis of a dark claret-colour above, pale below; whorls 6, slowly increasing in size, last not depressed in front, suddenly descending at the periphery, before descending being grooved with a narrow deep gutter continuous above the margin of the suture almost to the apex; aperture angularly lunate; peristome simple, thin, angled and notched above the middle by the termination of the groove; margins rather distant, columellar margin very slightly dilated and everted.

Diam., greatest 1·10, least 0·88; height 0·70 of an inch.

Hab. Solomon Islands.

HELIX HUNTERI, sp. nov. (Plate LII. fig. 11.)

Shell with a moderately large, deep, open perforation, globosely turbinate, thin, pale flesh-coloured, obliquely finely striated from above downwards, and longitudinally striated, especially on the second and third whorls, with coarser granose striæ; whorls 4½, rounded; spire depressedly conoid, apex obtuse, last whorl inflated, (partially) carinated below the middle, the line of carination being opaque or cretaceous; aperture slightly angled and elongately lunate; peristome thin, broadly reflexed, margins slightly approached, columellar margin triangularly dilated, overhanging and produced beyond the umbilicus.

Diam., greatest 1·08, least 0·92; height 0·86 of an inch.

Hab. Guadalcanar Island, Solomon Islands.

Closely allied to *H. lactiflua* and *H. isabellensis*; but this species has a large, deep, open, umbilicus.

HELIX BELMOREI, sp. nov. (Plate LII. fig. 12.)

Shell with a large open umbilicus, broadly trochiform, rather solid, opaque, obliquely finely irregularly striated, dark chestnut; whorls 6½, flat; suture very indistinct; spire bluntly conoid; the last whorl very sharply keeled, not depressed in front; base flat, more coarsely striated than above with a few irregular longitudinal striæ; excavated round the umbilicus; aperture trapezoid; peristome sharply angled and pointed at the keel, white and thickened towards the columellar margin, which is scarcely expanded.

Diam., greatest 1·00, least 0·90; height 0·50 of an inch.

Hab. Solomon Islands.

HELICINA JANA, sp. nov. (Plate LII. fig. 13.)

Shell conoid, rather solid, of a dull orange-brown colour, very finely irregularly transversely striated; apex pointed and finely spirally striated; whorls 4½ to 5, flat, last bluntly keeled; aperture triangular, rounded at the angles; base rounded, half covered with a thin, expanded, white callus; peristome thickened, white, continuous with the columella, which gradually expands out into the callus, partially covering the base.

Diam., greatest 0·17, least 0·14; height 0·16 of an inch.

Hab. Port Macquarie, east coast of Australia; found under leaves on the ground.

DESCRIPTION OF PLATE LII.

Figs. 1, 1*a*. *Voluta* (*Amoria*) *australiæ*, p. 643.
2. *Partula peasei*, p. 644.
3. *Bulimus sellersi*, p. 644.
4. *Helix andersoni*, p. 644.
5. —— *scandens*, p. 645.
6. —— *kempseyensis*, p. 645.
Fig. 7. *Helix macquariensis*, p. 645.
8. —— *guadalcanarensis*, p. 645.
9. —— *sellersi*, p. 646.
10. —— *compluviatus*, p. 646.
11. —— *hunteri*, p. 646.
12. —— *belmorei*, p. 647.
13. *Helicina jana*, p. 647.

7. Additional Notice concerning the Powder-Downs of *Rhinochetus jubatus*. By JAMES MURIE, M.D., F.L.S., F.G.S., &c., late Prosector to the Society. (Communicated by Prof. NEWTON, F.R.S.)

[Received October 19, 1871.]

In my memoir on the Kagu, Sun-bittern, and Boatbill, read in 1867, but only published by the Society this year, I enter at some length into the nature of the plumage of these aberrant types. After a somewhat complicated study of the powder-downs, their structure, situation, and mode of examination, I propose a set of terms as expressive of their distribution consonant with Nitzsch's terminology*. On looking over my article as printed, it seems to me a useful purpose would be served by the addition of a note showing the precise equivalents of the respective areas treated of by the above German authority and myself.

The subjoined tabular view of the nomenclature of Nitzsch and myself shows at a glance the relation of terms employed in distinguishing the several portions of the contour, feather-tracts, featherless interspaces, and powder-down patches.

Tract has been employed by Nitzsch for the lines of feathering, as shown in the first column; *space* for the bare portions, column two; and by simply using *patch* (column three to the right) I define where the powder-downs are found. The minor terms differ, but their import is easily understood. The blanks indicate portions wanting in one but present in the other, or where no subdivision has been recorded.

Nitzsch—Feathering generally.		Murie—Powder-downs.
Spinal or Dorsal Tract . . Anterior portion. Posterior portion.	Spinal or Dorsal Space . .	Dorsal Patches. Scapular portion. Lumbar portion. Iliac portion. Caudal portion.
Caudal Tract.	. . . .	
Inferior or Ventral Tract. Gular portion (and inner branch). Truncal portion (or thoracica gastrica). Lateral portion [knee-covert].	Inferior or Ventral Space. Gular portion. Pectoral portion.	Carino-ventral Patch. Sternal portion. Abdominal portion. Cloacal portion.
. . . .	. . . .	Lateral Sterno-ventral Patches. Pectoral portion. Gastric portion.
. . . .	. . . .	Coracoid Patch. Furcular portion.
. . . . Truncal and lateral portions of ventral tract.	Lateral Trunk Spaces . .	Costo-thoracic Patches.
Head Tract	Head Spaces . . . . Temporal portion. Nuchal portion.	Cranio-nuchal Patch. Head portion. Nape portion. Throat portion.
Lateral Neck Tracts	Lateral Neck Spaces. . . .	Lateral Neck Patches.
Humeral Tracts	Upper Wing Spaces	Humeral Patches. Brachial portion. Axillary portion.
Wing or Alar Tracts. . . .	Lower Wing Spaces	Cubital portion. (Ant. and post.) Alar portion.
Femoral or Lumbar Tracts.	. . . .	Femoral Patches.
Crural Tracts	Crural Spaces	Crural Patches.

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* 'Pterylographie,' and Ray Society's edition, 1867.

8. On a remarkable Sexual Peculiarity in an Australian Species of Duck. By Alfred Newton, M.A., F.R.S., V.P.Z.S.

[Received November 6, 1871.]

It is now getting on for nearly a year since I received from the Secretary the bodies of two Australian Ducks which had recently died in our Gardens. The species to which they belong is that known as "*Anas punctata*, Cuvier" *—a name I take as given, not having satisfied myself that it is one which ought to be used.

The specimens, the skins of which I now exhibit, were in the diverse plumage which has been fully described as characterizing the two sexes; and I confess that from such knowledge as I had of the internal structure of the section of the family *Anatidæ* to which this species obviously belongs I never anticipated finding any thing sufficiently novel in the present case to justify me in bringing it to the notice of the Society. How agreeably disappointed I was will be seen.

Being much engaged by other occupations, and, as I have said, not expecting any remarkable feature to be presented, I sent the specimens to Mr. Baker of Cambridge, requesting him to skin them, ascertain the sex of each, and prepare the sternums and tracheas. This he did; and when I add that I have known Mr. Baker for more than twenty years to be a man on whom I can fully rely, I trust no suspicion of the possibility of error may cross the minds of zoologists in consequence of my not having myself made the dissections.

The sternum of every species of freshwater Duck that I have previously seen presents at its posterior end a deep fissure on either side; but this fissure is occasionally so much bridged across by the prolongation of its inner margin in an outward direction that I have been fully prepared to find the junction completed in some specimen, either as a characteristic of the species, as it is in some of the diving Ducks, or even as an individual peculiarity. I was therefore not much surprised to see complete fenestration effected in one of the sternums (that of the male) of the species now before me, though the other (that of the female) retains the normal fissures of a freshwater Duck. However, it may be gathered from remarks which I once contributed to make elsewhere* that I do not attach much importance to this feature. In other respects the sternums present no characters on which I need dwell; that of the female is somewhat smaller than that of the male; but it will be worth ascertaining whether the fenestration in the latter is constant.

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* Two perfectly distinct species have had the name *Anas punctata* applied to them—the subject of this notice, and one from South Africa described by Burchell in 1822 (Travels, &c. i. p. 283, note). The earliest publication I can find of "*Anas punctata*, Cuv.," is by Mr. G. R. Gray in 1844 (List of &c. *Anseres*, p. 134); but whence he obtained the information he cannot, as he kindly tells me, recollect. Lesson in 1831 (Tr. d'Orn. p. 634) has an "*Anas punctata*, Gal. de Paris," which, though he suggests it may be one of Horsfield's species, is probably the same as the one meant by Mr. Gray, since Dr. Pucheran (R. Z. 1850, p. 549) has identified the specimen which bore that name in the Paris Museum with the Australian species figured under the same designation by Mr. Gould (B. Austral. vii. pl.). In Dr. Hartlaub's 'Index' to Dr. Pucheran's valuable paper (J. f. O. 1855, p. 419) notice of this case is unfortunately omitted. Unless it can be shown that Cuvier's name was *published* before Burchell's (and this is extremely unlikely), *punctata* must of course be kept for the South-African bird, with which (as Mr. Gray has suggested to me) Sir Andrew Smith's subsequently designated *Querquedula hottentotia* (Zool. S. Afr. *Aves*, pl. 105) seems to be identical; and the Australian bird will take up with its next synonym—standing then as *Anas castanea* (Eyton).

Fig. 1.

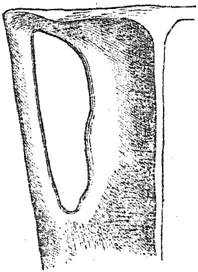

Fig. 2.

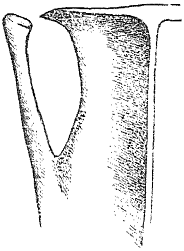

Fig. 1. Left side of posterior end of sternum of *Anas punctata*, ♂, seen from above.
2. Corresponding view in the female.

My surprise, however, was great when I came to see the tracheas. Accustomed as I had been to find in all the freshwater Ducks the trachea of the male with its usual bony enlargement or labyrinth (*bulba ossea*) situated immediately above the bronchial tubes, and

Fig. 3.

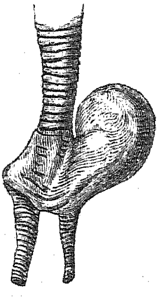

Fig. 4.

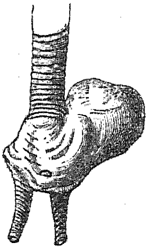

Fig. 3. Lower part of trachea of *Anas punctata*, ♂.
4. The same, ♀.

this, with the single exception of the Garganey (*Anas querquedula*, Linn.), of uniform pattern throughout the whole group, the trachea of the female being invariably devoid of such enlargement, it very much interested me to see that in the present species, while the male retained the normal and characteristic structure of this organ, the female enjoyed the same appendage, and that in a degree only slightly less developed. In either sex the trachea is somewhat enlarged above the *bulla ossea*, and then, as usual, rapidly tapers; and in both the *bulla ossea* is outwardly of the same general form as it is in the male of *Anas boschas*, Linn. I have inquired of Mr. Bartlett whether any peculiarity was observed in the call-note of the female bird during her captivity in our Gardens, but I cannot learn that such was the case.

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* Phil. Trans. 1869, p. 337.

I abstain from making any comments on the curious fact I have mentioned, which is, so far as I am aware, unique; but it would be easy to enter upon some speculations as to its bearings on the important question of "Sexual Selection" which is now being agitated. I will, however, say that, though I know not how far other ornithologists are likely to agree with me, I conceive that, if we wish for a natural subdivision of the two large groups of *Anatidæ* formed by what are generally termed the *Anatinæ* and *Fuligulinæ*, the characters afforded by the trachea ought to be fully studied; and I venture to refer to some suggestions on that question which I published some years ago in America[*]. It should be one of the first objects of every collector in foreign countries to examine the trachea of each bird that he skins; and nowhere is this more necessary than with members of the *Anatidæ*.

I am much averse to inventing new groups; but I think it very possible that this species, being thus shown to differ so singularly from any Duck with which we are acquainted, will be made the type of a new genus or subgenus; and as some enthusiast may wish when conferring a name on a section so established to celebrate that of some notable person of the gentler sex who is gifted with masculine attributes, I think it as well to anticipate such a proceeding, and therefore suggest that if a new division be found expedient it should bear the appellation of *Virago*[†], as a tribute to the virile characteristic of the ladies in question and of the female of this species of Duck.

November 21, 1871.

Professor Flower, F.R.S., V.P., in the Chair.

Mr. Sclater exhibited and made remarks on a fine skin of *Ateles variegatus*, Wagner (= *A. bartletti*, Gray), which had recently been received by Madame Verdey of Paris in a collection from Oyapok, situated on the river of the same name on the eastern limits of

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[*] Report of the Smithsonian Institution for 1860, p. 420.

[†] *Virago* e genere *Anatino* cujus fœmina eadem quæ mas organa vocis habet.

Cayenne. Mr. Sclater remarked that this gave a still wider extent of range to this Spider Monkey than had been indicated by himself and Mr. E. Bartlett in recent remarks upon this species*.

A communication was read from Professor Owen, F.R.S., containing the third of a series of memoirs on the osteology of the Marsupials. In this communication Professor Owen entered at full length into the modifications observable in the cranium of the three known species of Wombats (*Phascolomys*).

This paper will be published in the Society's 'Transactions.'

The following papers were read:—

1. Report on several Collections of Fishes recently obtained for the British Museum. By Dr. ALBERT GÜNTHER, F.R.S., F.Z.S.

[Received October 27, 1871.]

(Plates LIII–LXX.)

In the course of the present year several important collections of Fishes have been obtained by the Trustees of the British Museum:—

1. A collection of 255 examples from the Museum of Hr. Cæsar Godeffroy of Hamburg. The majority of the species represented in this collection were desiderata to the British Museum, whilst the remainder of the specimens had been obtained at localities hitherto ichthyologically unknown, and consequently important for our knowledge of the geographical distribution of the species. Thus we have received the first examples from the Ellice, Cook's, and Pelew Islands, further considerable additions to the fauna of the Tonga and Samoa Islands, and several new species from localities on the north coast of New Holland. This collection contained also several desiderata from the coasts and fresh waters of California, Chile, and the Chincha Islands.

2. Dr. A. Bernhard Meyer, immediately after his safe arrival at Manado, proceeded to despatch some very extensive collections, and sent several thousands of examples of fishes alone. Of these about 200 were selected for the British Museum, which had scarcely any fishes from the Island of Celebes. We might have expected that but few novelties would be contained in a collection made at a place to which Dr. Bleeker's attention had been directed for a number of years, and from which he has enumerated some 760 species. Yet Dr. Meyer's researches have been rewarded by the discovery of a relatively considerable number of interesting forms, among which is a true Gadoid; the occurrence of a representative of this family in the East-Indian archipelago (see p. 669) is a most important fact.

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* See *antea*, pp. 217 et 224.

3. Our collection of fishes of the South-Australian region has been enriched by several presents made by the Trustees of the Museum at Sydney, and by Mr. Morton Allport of Hobart Town. They have yielded fresh evidence with regard to the surprising fact that quite a number of common European marine fishes which hitherto have never been met with between the Tropics reappear in temperate seas of the southern hemisphere (see the remarks on *Clupea sprattus*, p. 672).

Other, smaller acquisitions need not be mentioned specially; and in the following pages I limit myself to diagnoses of those species only which appear to me to be undescribed, and to some remarks on a few known species. The descriptions are given in systematic order; but it may be useful to precede them with a list in which the species are geographically arranged.

1. GABOON.

Hemichromis subocellatus, p. 666.
Nannæthiops unitæniatus, p. 670.
Mormyrus lepturus, p. 670.

2. PORT NATAL.

Halidesmus scapularis, p. 668.

3. CELEBES.

Anthias rhodopeplus, p. 654.
—— *chrysostictus*, p. 655.
Plectropoma anthioides, p. 655.
Apogon savayensis, p. 656.
Priacanthus meyeri, p. 656.
Pristipoma manadense, p. 657.
Sebastes rhodochrous, p. 659.
Cubiceps multiradiatus, p. 661.
Peristethus liorhynchus, p. 663.
Pseudophycis peregrinus, p. 669.
Belone punctulata, p. 670.
Engraulis bœlama (Forsk.), p. 671.
Pœciloconger fasciatus, p. 673.

4. JAPANESE SEAS.

Gobius elapoides, p. 665.

5. FEEJEE, TONGA, AND SAMOA ISLANDS.

Apogon savayensis, p. 656.
Diagramma obscurum, p. 657.
Holocentrum microstoma (Gthr.), p. 660.
—— *diploxiphus*, p. 660.
Acanthurus aterrimus, p. 660.
Gobius leucostictus, p. 664.
Platyglossus nigromaculatus, p. 666.
—— *notopsis*, p. 666.
Chilinus godeffroyi, p. 666.
Anguilla obscura, p. 673.
Muræna tænioides, p. 674.

6. COOK'S ISLANDS.

Ambassis miops, p. 655.
Callionymus cookii, p. 665.
Myxus leuciscus, p. 666.
Hemirhamphus acutus, p. 671.

7. SANDWICH ISLANDS.

Peristethus engyceros, p. 663.

8. NORTH-EASTERN AUSTRALIA.

Gobius platystoma, p. 664.
Blennodesmus scapularis, p. 667.
Tetrodon pleurostictus, p. 674.

9. QUEENSLAND.

Chiloscyllium modestum, p. 654.

10. SOUTH AUSTRALIA AND TASMANIA.

Histiopterus labiosus, p. 658.
Platycephalus cinereus, p. 661.
Gobius mucosus, p. 663.
Patæcus subocellatus, p. 665.
Clupea sprattus (L.), p. 672.
Geotria allporti, p. 675.

11. CHILE.

Urolophus chilensis, p. 653.
Muræna chilensis, p. 674.

UROLOPHUS CHILENSIS. (Plate LIII.)

Disk broader than long; snout a little projecting; tail longer than the disk. Disk smooth, but with spines along the median line, viz. three in a single series in the middle of the back, and two on the tail, in front of the serrated spine. No rudimentary dorsal fin.

Upper parts nearly uniform brownish, with a few very indistinct darker specks.

Distance of the extremity of the snout from the vent. .	4½ inches.
Distance of the extremity of the tail from the vent . .	5¾ „
Greatest width of the disk	6½ „

One example, from the Godeffroy Museum, is in the collection of the British Museum.

Chiloscyllium modestum. (Plate LIV.)

The lower labial fold is not continued across the symphysis. Mouth at the lower surface of the snout, at some distance from its extremity, but nearer to the latter than to the eye. Dorsal fins subequal in size, with the angles not produced, close together, the distance between them being somewhat more than one half of the length of the base of the first. Origin of the first dorsal above the middle of the base of the ventral. Uniform brown, darker on the back than on the sides.

The skin of a single example (female, 20½ inches long), was obtained with other objects from Queensland.

Serranus humeralis (C. & V.)

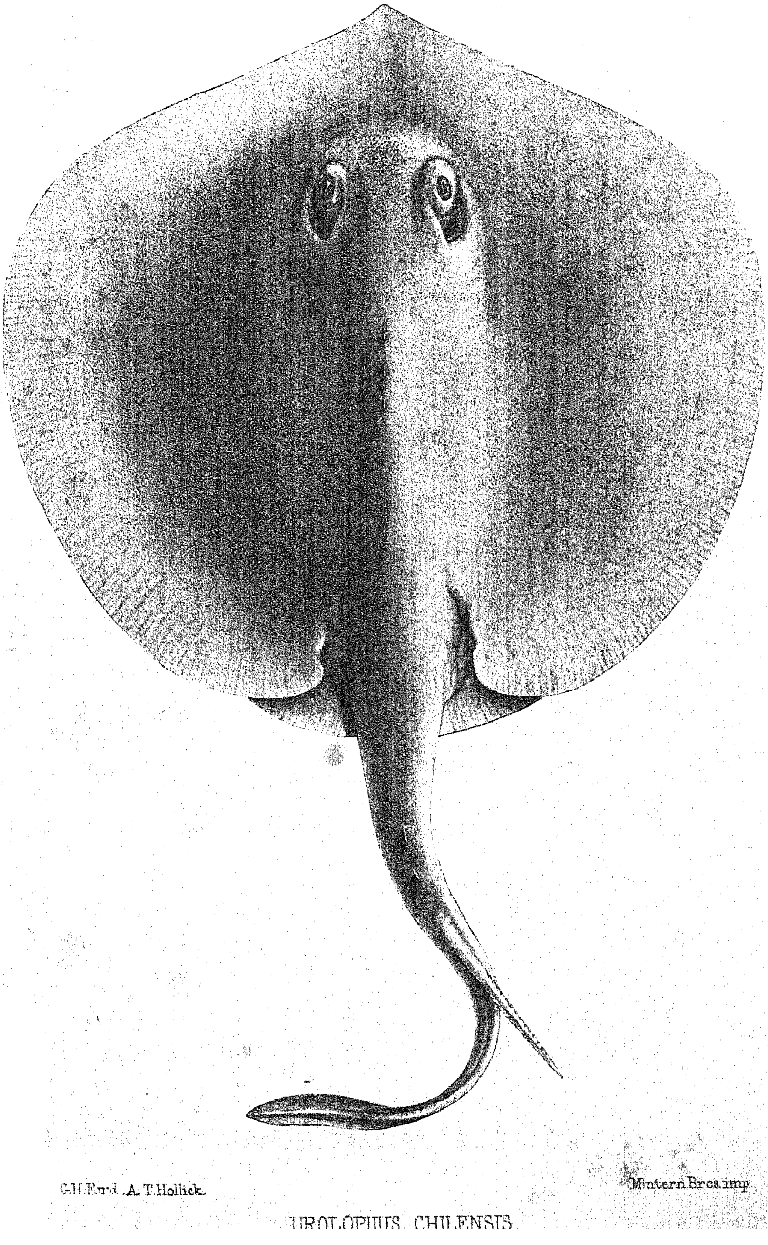
= *Serranus albomaculatus* (Jenyns).

Anthias rhodopeplus. (Plate LV.)

D. $\frac{10}{13}$. A. 3/7. L. lat. ca. 35.

The height of the body is a little more than the length of the head, and two fifths of the total (without caudal). The width of the interorbital space is less than the diameter of the eye, which is one third of the length of the head, the snout being very short. Angle of the præoperculum with a very prominent flat spine, single or double. The canine teeth of the lower jaw are strongly curved, considerably stronger than those of the upper, and placed more towards the side. The vomerine teeth form a ◇-shaped band; the palatine band broader and rounded in front, tapering behind. Tongue with a large rounded patch of villiform teeth. Scales on the body rather irregularly arranged, those on the head much the smallest. The third dorsal spine, the anterior dorsal rays, the caudal lobes, and the two outer ventral rays produced into filaments. Sides of the fish reddish rose-coloured; an oblique golden-yellow band runs from the præorbital below the eye towards the angle of the præoperculum. The uppermost part of the back and the nape golden yellow. Most of the scales on the side with a pinkish-violet spot on the base; back of the tail pinkish violet. Fins reddish rose-coloured; the dorsal rays with blackish-brown rings; base of the caudal crossed by a blackish-brown band.

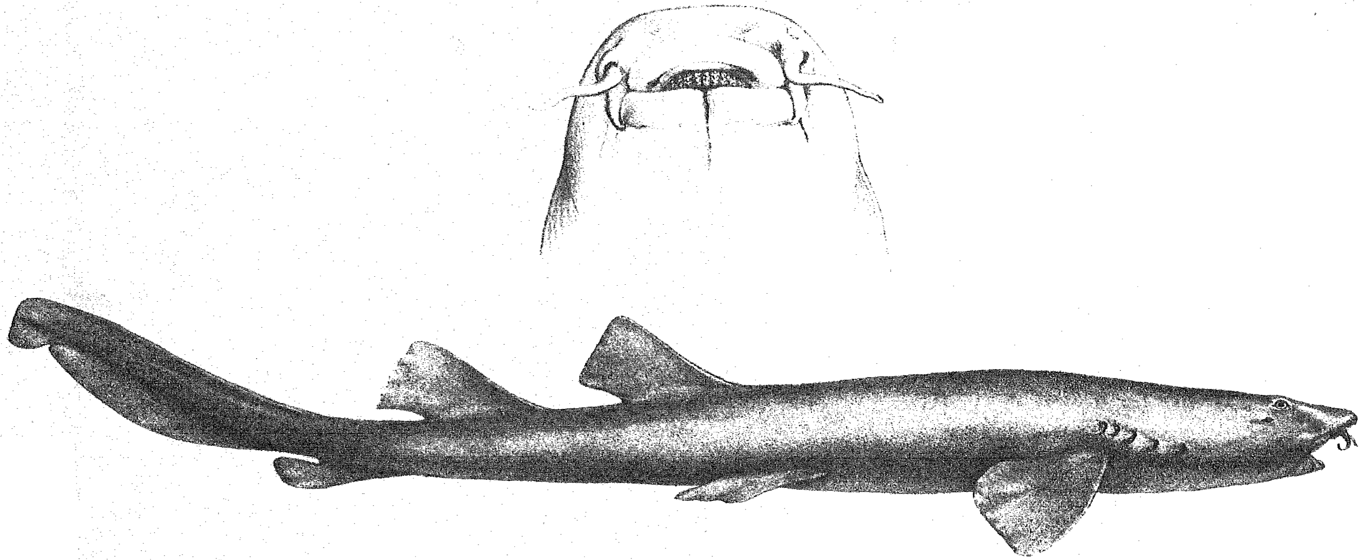
One specimen, 6½ inches long, has been sent by Dr. B. Meyer from Manado.



G.H.Ford. A.T.Hollick.

Mintern Bros. imp.

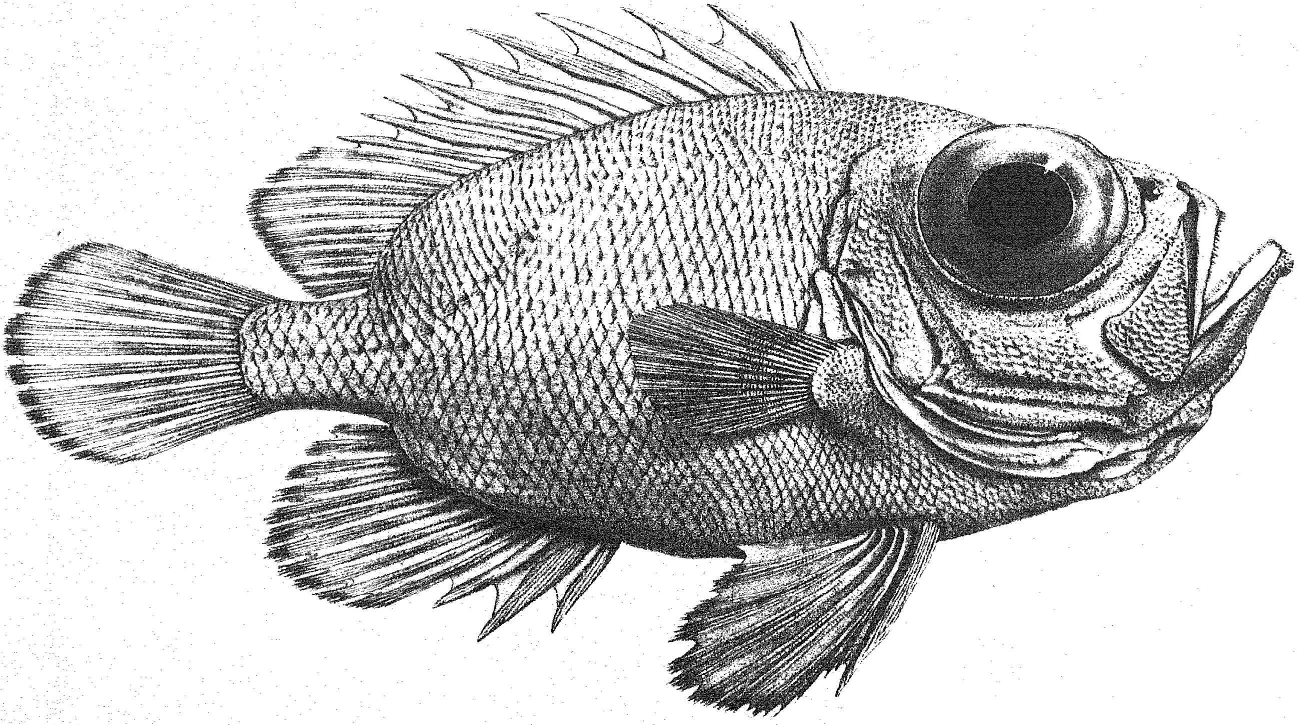
UROLOPHUS CHILENSIS.



G.H.Ford. C.L.Griesbach.

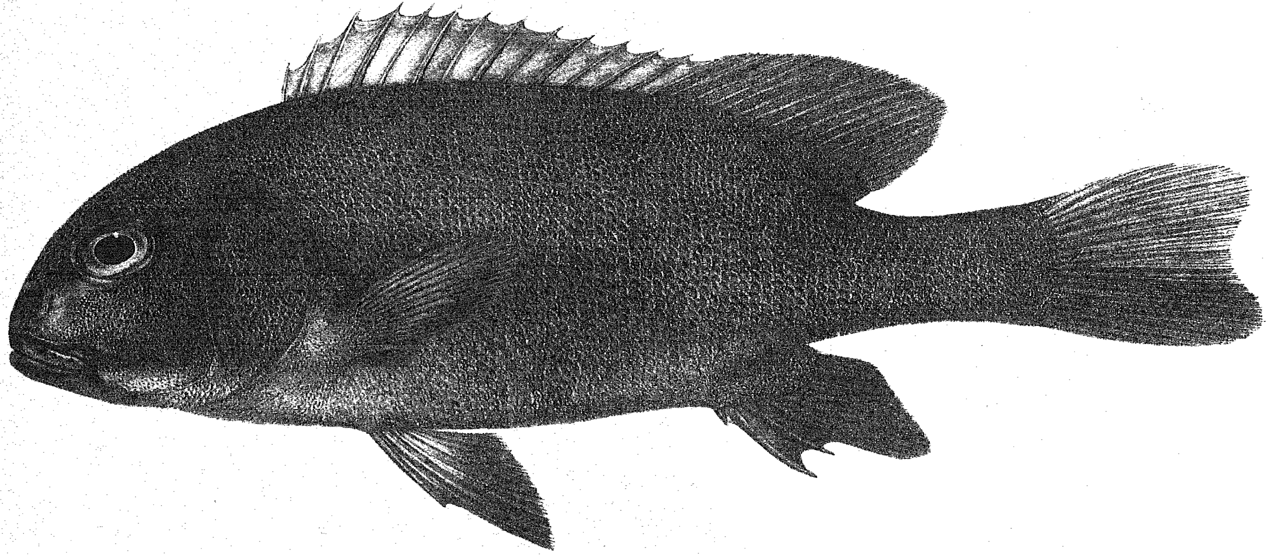
Mintern Bros imp.

CHILOSCYLLIUM MODESTUM.



G.H. Ford. C.L. Griesbach. Mintern Bros. imp.

PRIACANTHUS MEYERI.

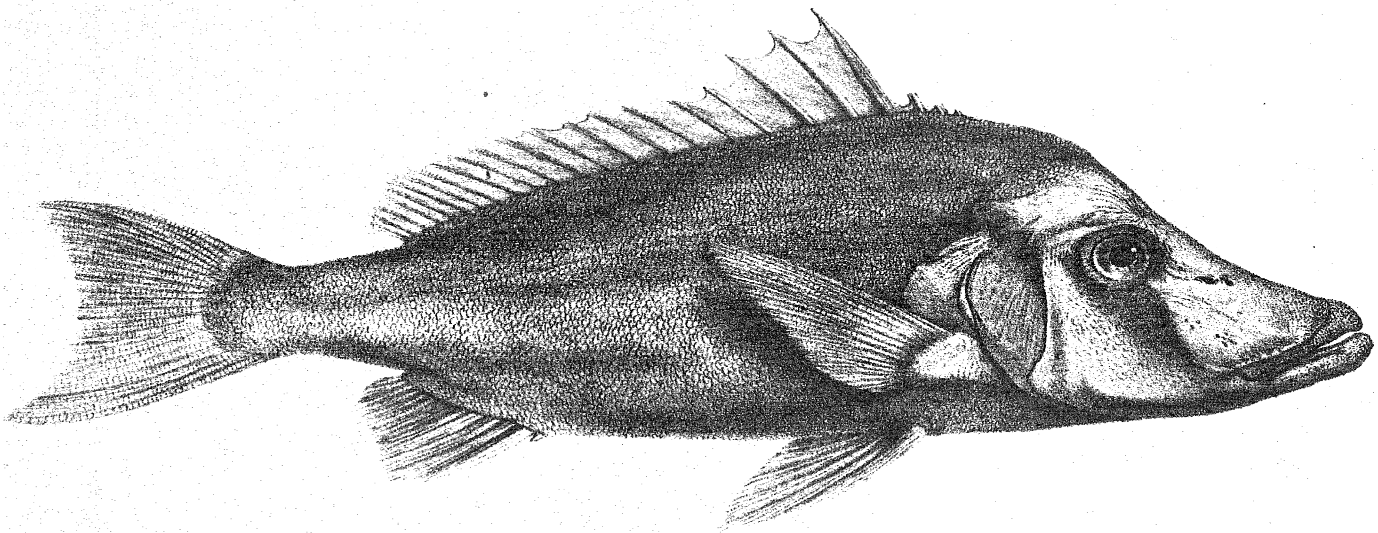


G.H.Ford . C.L.Griesbach.

DIAGRAMMA OBSCURUM.

Mintern Bros imp.

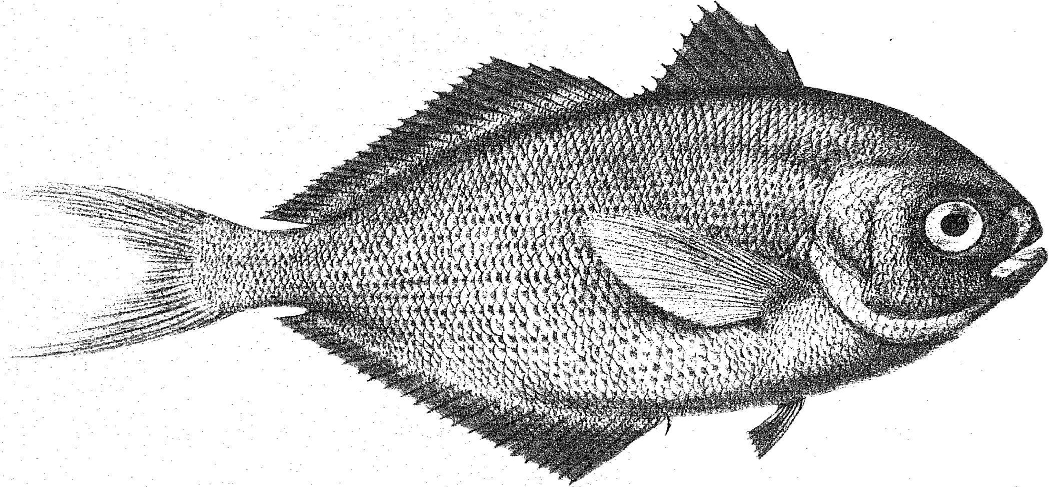
P. Z. S. 1871. Pl. LIX.



G H Ford. C.L. Griesbach.

Mintern Bros imp.

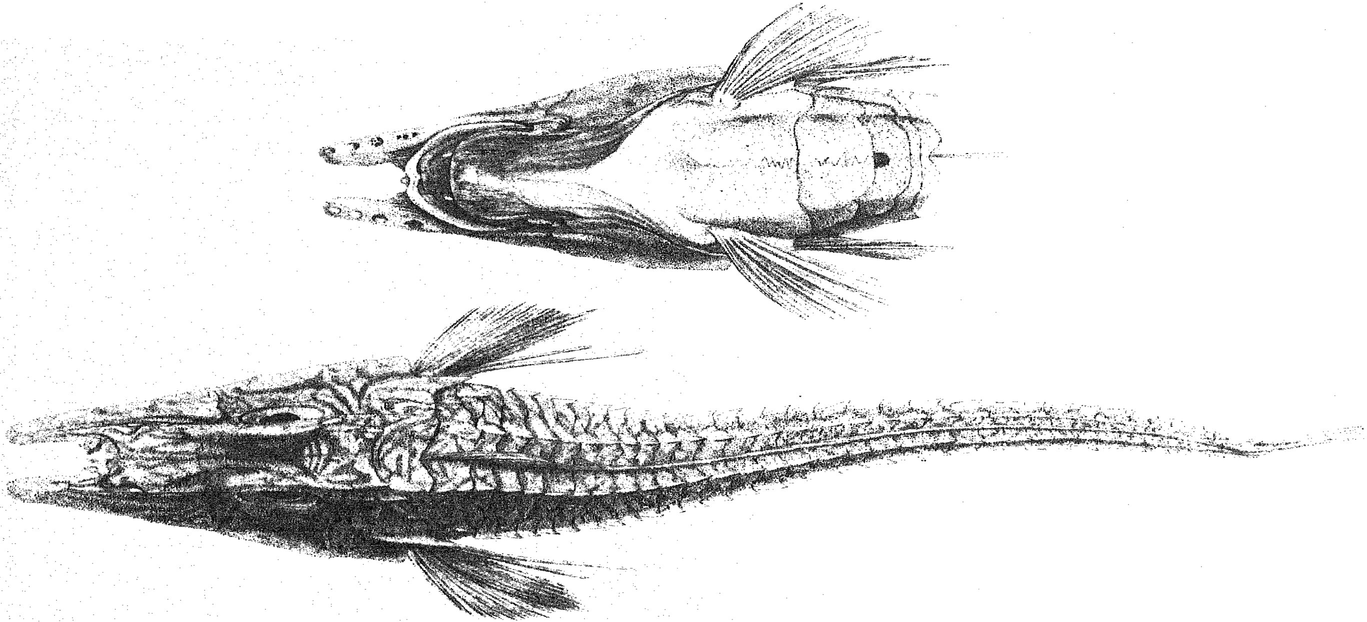
HISTIOPTERUS LABIOSUS.



G.H.Ford. Cl. Griesbach.

Mintern Bros. imp.

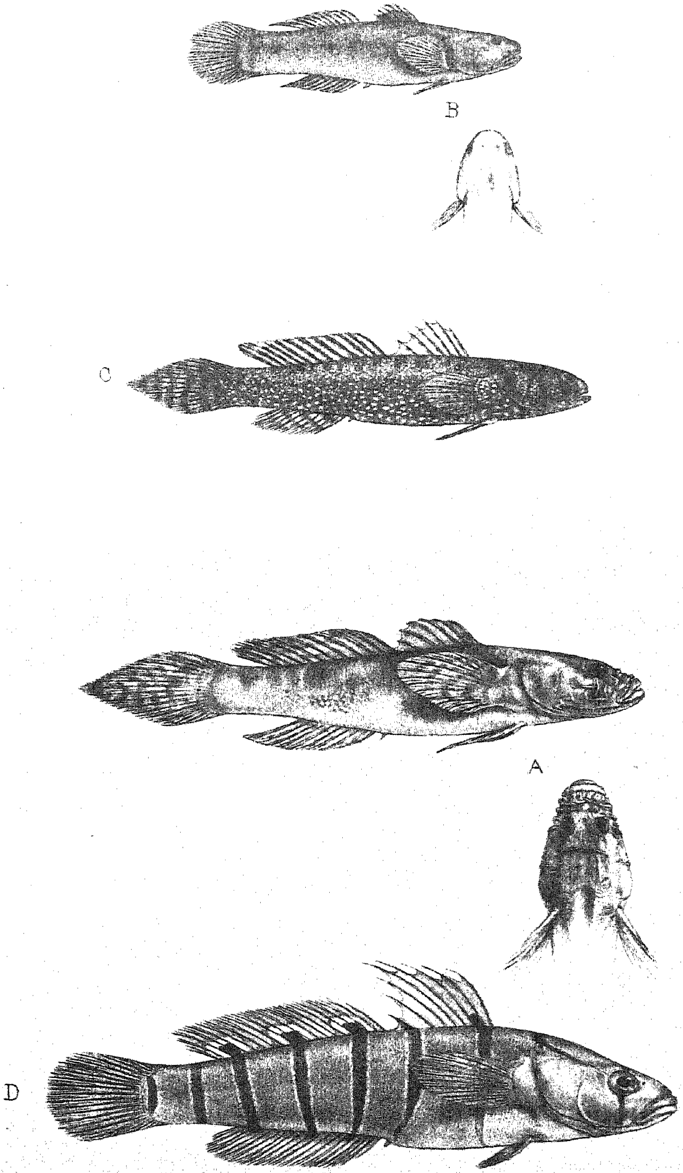
CUBICEPS MULTIRADIATUS.



G.H.Ford . C.L.Griesbach.

Mintern Bros. imp.

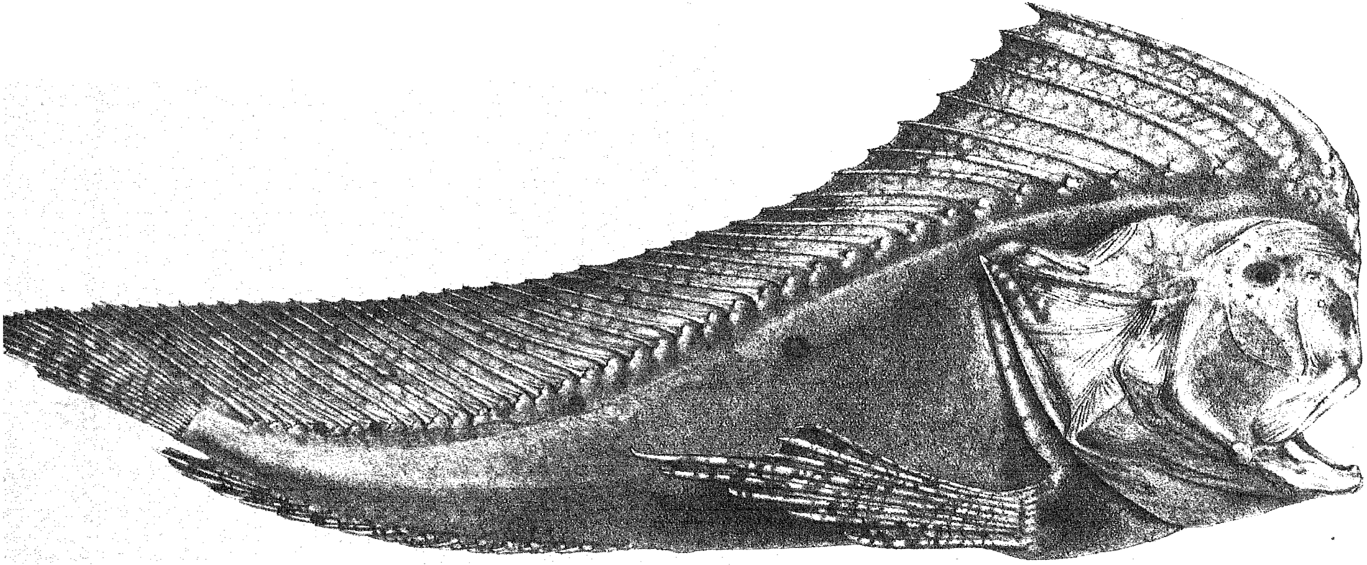
PERISTETHUS LIORHYNCHUS.



G.H.Ford.
Mintern Bros imp.

A. GOBIUS MUCOSUS. B. GOBIUS PLATYSTOMA.

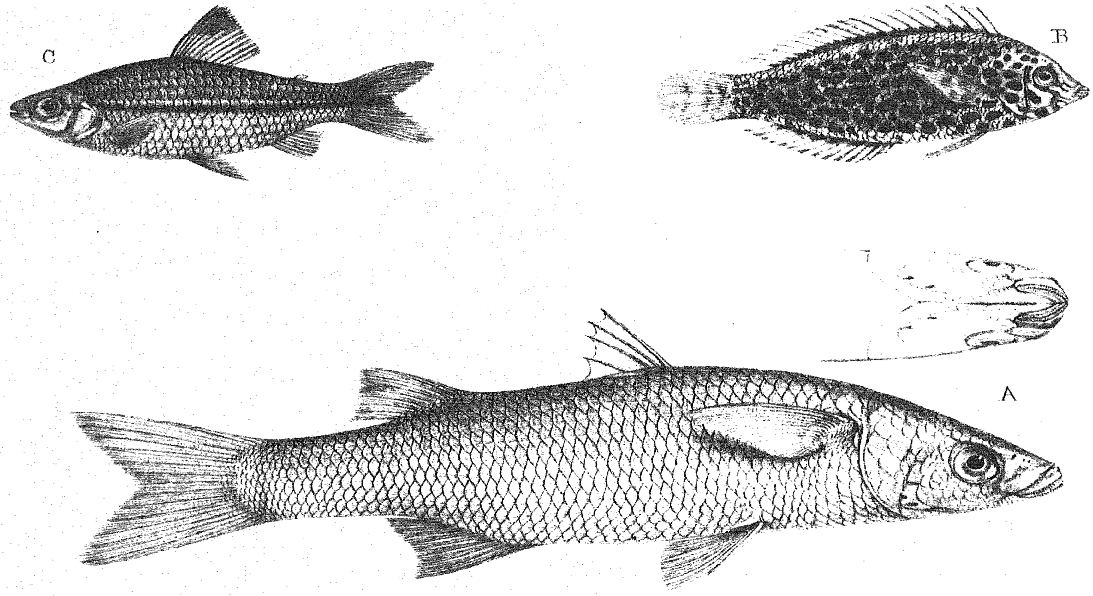
P. Z. S. 1871. Pl. LXIV.



G.H.Ford . A. T. Hollick.

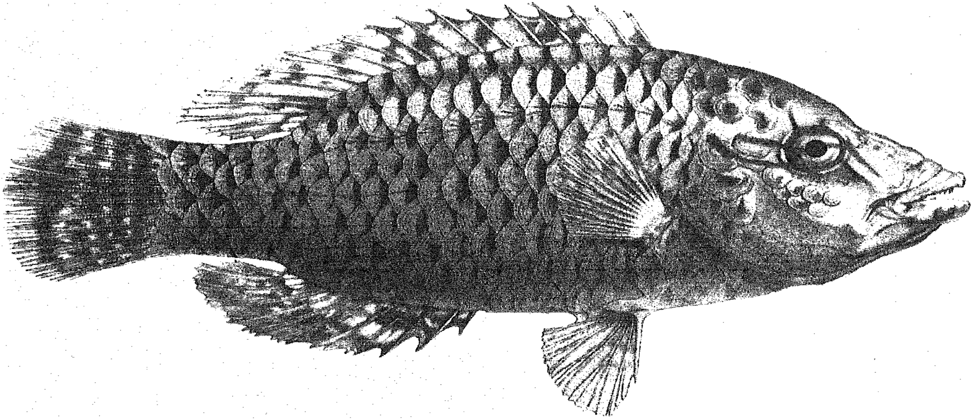
Mintern Bros. imp.

PATÆCUS SUBOCELLATUS.



G.H.Ford. R.Mintern.
Mintern Bros imp.

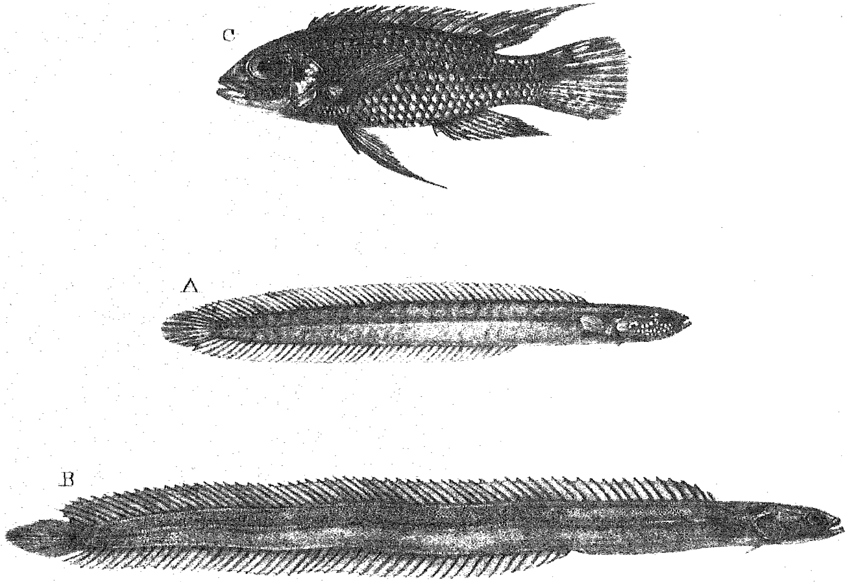
A. MYXUS LEUCISCUS. B. PLATYGLOSSUS NIGROMACULATUS. C. NANNÆTHIOPS UNITÆNIATUS.



G.H.Ford d. C L. Griesbach.

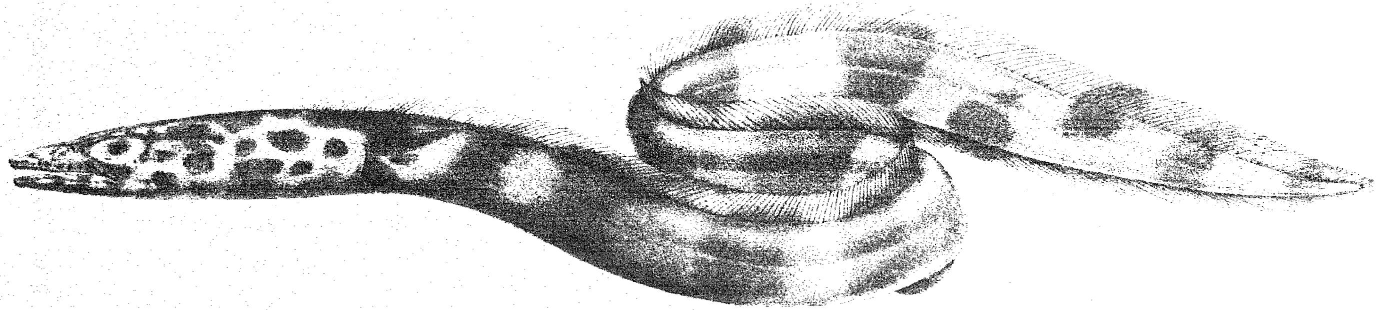
Mintern Bros imp.

CHILINUS GODEFFROYI.



G.H. Ford.
Mintern Bros. imp.

A. BLENNODESMUS SCAPULARIS. B. HALIDESMUS SCAPULARIS. C. HEMICHROMIS SUBOCELLATUS



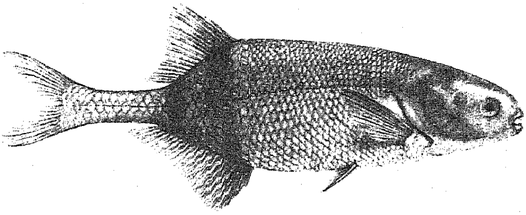
C.H. Ford. C.L. Griesbach.

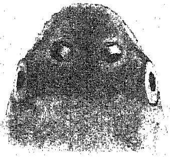
Mintern Bros. imp.

POECILOCONGER FASCIATUS.

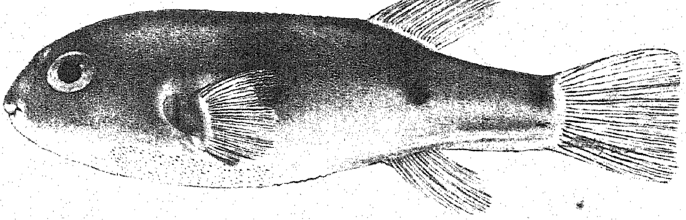
P. Z. S. 1871. Pl. LXIX.

B





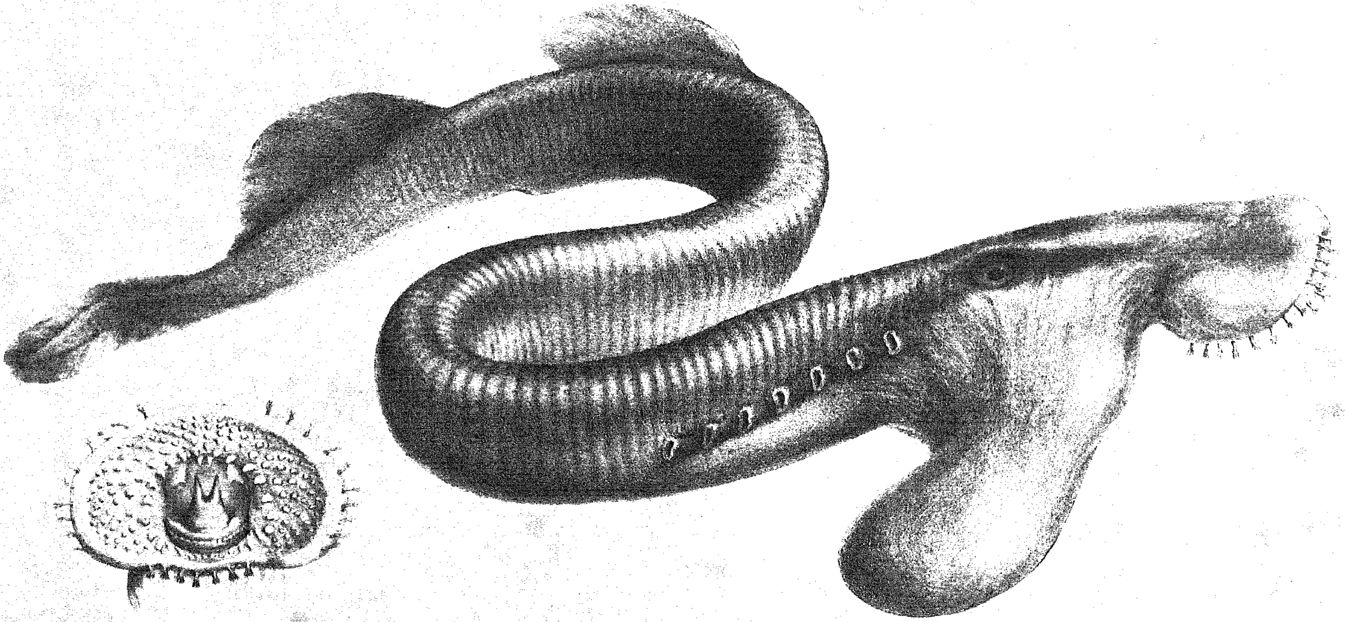
A



G.H.Ford. R.Mintern.

Mintern Bros. imp.

A. TETRODON PLEUROSTICTUS.
B. MORMYRUS LEPTURUS.



G.H.Ford.

GEOTRIA ALLPORTI

Mintern Bros imp.

ANTHIAS CHRYSOSTICTUS. (Plate LVI.)

D. $\frac{10}{16}$. A. $\frac{3}{7}$. L. lat. ca. 42.

The height of the body is contained twice and one third in the total length (without caudal), the length of the head thrice. The width of the interorbital space is less than the diameter of the eye, which is one third of the length of the head, the snout being very short. Angle of the præoperculum with a single or double spine. An outer series of stronger teeth in the upper jaw; the lower canines are rather stronger than the upper, and placed more towards the side. The vomerine teeth form a ◇-shaped band; the palatine band crescent-shaped, broadest in the middle, separate from the pterygoid band. Tongue nearly entirely covered with teeth. Scales on the body somewhat irregularly placed, those on the head much the smallest. The second and third soft rays of the dorsal, the second of the anal, the caudal lobes, and the two outer ventral rays produced into filaments. Rose-coloured, each scale with a bright yellow centre. Upper parts of the head yellow, with a pink spot between the nostrils; an oblique bright yellow band from the præorbital below the eye to the base of the pectoral fin. The soft dorsal yellow, with oblique violet stripes between the rays; caudal fin yellow, with the upper and lower margins and the central rays pinkish violet.

Two examples, 4½ and 6½ inches long, were obtained by Dr. B. Meyer at Manado.

PLECTROPOMA ANTHIOIDES.

D. $\frac{10}{17}$. A. $\frac{3}{7}$. L. lat. 35. L. transv. 3/14.

The height of the body equals the length of the head, and is contained twice and three fourths in the total (without caudal). Interorbital space narrow, its width being not quite one half of the diameter of the eye, which is one fourth of the length of the head, and equal to that of the snout. The maxillary extends to below the middle of the eye. Canine teeth moderately strong. Vomerine band of teeth angularly bent, and narrow like the palatine band. Scales on the cheek regularly arranged, in five or six series. The third dorsal spine is the longest, twice as long as the second, and half as long as the head; the second anal spine longer and stronger than the third. Caudal fin rounded. Pectoral extending beyond the commencement of the anal. Red, with some irregular and indistinct blackish spots on the back. A blackish band runs along the median line of the nape.

One specimen, 4 inches long, from Manado, through Dr. B. Meyer.

AMBASSIS MIOPS.

Closely allied to *A. urotænia*, from which it differs by the smaller size of the eye and the lateral line being continuous. The diameter of the eye in *A. urotænia* is equal to the length of the postorbital part of the head.

D. $7|\frac{1}{9}$. A. $\frac{3}{10}$. L. lat. 29.

The height of the body is contained twice and three fourths in the total length (without caudal), the length of the head thrice. The diameter of the eye is one third of the length of the head, and much less than that of the postorbital portion. Præorbital strongly serrated. Lateral line continuous. The second dorsal spine is rather shorter than the third, and contained four times and one fourth in the total length (without caudal). The third anal spine longer than the second, but considerably shorter than the second of the dorsal. Body with a silvery longitudinal band; the membrane between the second and third dorsal spines and a band along each caudal lobe blackish.

One specimen (no. 256), $2\frac{3}{4}$ inches long, from the Godeffroy Museum; it is from Rarotonga (Cook's Islands).

This species is undoubtedly distinct from our specimens from Celebes and the Seychelles named *A. urotænia,* and easily distinguished by the difference in the size of the eye. But we may hesitate to affirm its distinctness from the specimens from Amboyna and Wahai, described by Bleeker under the same name. He states that the diameter of the eye is *two fifths or one third* of the length of the head (Nat. Tyds. Ned. Ind. 1852, p. 257), an amount of variation as I have never observed it in *Ambassis.*

APOGON SAVAYENSIS.

D. $7\left|\frac{1}{9}\right.$. A. $\frac{2}{8}$. L. lat. 26.

The height of the body is nearly equal to the length of the head, and two fifths of the total (without caudal). The width of the interorbital space is two thirds of the diameter of the eye, which is two fifths of the length of the head, and equal to that of the postorbital portion. Only the posterior edge of the præoperculum is finely denticulated. Dorsal spines feeble: the first minute, the third the longest and as long as the eye. Caudal fin subtruncated. Ventral fins extending to the vent. Bronze-coloured; an oblique blackish band from the eye to the angle of the præoperculum. A blackish cross band on the back of the tail, about three scales broad, and not extending downwards beyond the lateral line.

One specimen (no. 78) from Savay (Samoa Islands), $2\frac{1}{2}$ inches long, has been obtained from the Godeffroy Museum. Two other examples, $3\frac{1}{2}$ inches long, have been sent from Manado by Dr. Meyer.

This species appears to be closely allied to *A. bandanensis* (Blkr.); but our specimens have no bands on the body, and Bleeker does not mention the oblique band on the cheek, which, however, is more distinct in the specimen from Savay than in those from Celebes.

PRIACANTHUS MEYERI. (Plate LVII.)

D. $\frac{10}{12}$. A. $\frac{3}{11}$. L. lat. 48.

The height of the body is more than one half of the total length (without caudal), the length of the head three sevenths. *Eye enormously large, one half of the length of the head.* The posterior nasal opening is wide, crescent-shaped, with the convexity turned forwards, situated on the upper side of the head. Spine at the angle of the præoperculum very indistinct; limbs of the præoperculum subequal in length. Caudal fin rounded. Spines of the fins very strong, deeply striated, without roughnesses; the second and last dorsal spines subequal in length, but much shorter than the fourth and fifth, which are the longest. The ventral fins reach to the anal fin. Uniform reddish rose-coloured. Vertical and ventral fins with a black margin.

One example, 10½ inches long, has been sent from Manado by Dr. B. Meyer.

PRISTIPOMA MANADENSE.

D. $\frac{11}{15}$. A. $\frac{3}{7}$. L. lat. 50. L. transv. 6/13.

The height of the body is contained twice and two thirds in the total length (without caudal), the length of the head twice and one fifth. The diameter of the eye is one fifth of the length of the head, or two thirds of that of the snout. Upper jaw scarcely longer than lower; *maxillary not extending to the front margin of the orbit.* The posterior limb of the præoperculum emarginate, with the angle rounded, denticulated, but not produced. Spines of the fins very strong; the two anterior of the dorsal very short, *the second not half as long as the third, which is the longest,* and nearly half as long as the head. The other spines become gradually shorter, the last being only half as long as the first ray. The second anal spine is much stronger and longer than the third, and nearly as long as the third dorsal spine. Caudal fin truncated. Pectoral pointed, extending to the vent. Silvery; upper half of the body with small blackish spots, which occupy the base of the scales. Dorsal fin with two rather irregular series of round blackish spots, each of the size of the pupil. The other fins immaculate, or with a slight blackish tinge.

One specimen, 13 inches long, has been obtained at Manado by Dr. B. Meyer.

DIAGRAMMA OBSCURUM. (Plate LVIII.)

D. $\frac{13}{17}$. A. $\frac{3}{7}$. L. lat. 75. L. transv. 13/24.

The height of the body is contained twice and three fourths in the total length (without caudal), the length of the head thrice and a half. The diameter of the eye equals the extent of the snout, and is contained thrice and two thirds in the length of the head. The maxillary extends to the front margin of the eye. The third to seventh dorsal spines are equal in length, one third of the length of the head, and not much longer than the following. All are of moderate strength. The length of the longest dorsal rays is less than one half of the depth of the body. Caudal fin emarginate, with the lobes rounded. The second and third anal spines subequal in length, and much stronger than those of the dorsal. The pectoral is rather shorter than the ventral, which does not quite extend to the vent. The least depth of the free portion of the tail is considerably less than its length. Body uniform brownish black, the scales of the lower part of the body lighter in the centre. Fins black; the lower half of the caudal of a deeper shade than the upper.

Feejee Islands. One specimen (no. 280), 8½ inches long, from the Godeffroy Museum.

DENTEX RIVULATUS (Rüpp.).

Gymnocranius rivulatus, Klz.

This species is found at the Seychelle Islands; it is the "*Sphærodon grandoculus*" of Col. Playfair's List of Seychelle Fishes.

HISTIOPTERUS LABIOSUS. (Plate LIX.)

B. 6. D. $\frac{7}{17}$. A. $\frac{2}{11}$.

The height of the body is somewhat less than the length of the head, and one third of the total (without caudal). Upper profile of the head concave; snout much produced, the eye being entirely situated in the posterior half of the length of the head. Mouth of moderate width, the angle of the mouth being much nearer to the vertical from the eye than to the end of the snout. Lower jaw slightly the longer; lips and chin densely covered with short papillæ. The teeth are in bands *en cardes*, and most of those of the sides are very obtuse, molar-like. The scales on the cheeks hidden below the skin. Præoperculum with the hind margin concave, and with the angle projecting; the angle and lower margin are indistinctly denticulated. Opercles scaleless. Scales very small. Dorsal spines strong, the fourth being the longest; the seventh not much shorter than the first ray. Caudal fin emarginate, with the angles pointed. Pectoral, two thirds as long as the head, with the upper rays longest. Brown, with indistinct blackish longitudinal markings.

One specimen, 22 inches long, from South Australia.

CHÆTODON MILIARIS (Quoy & Gaim.).

D. $\frac{13}{22}$. A. $\frac{3}{19}$. L. lat. ca. 39.

The depth of the scaly part of the body is two thirds of the total length (without caudal). Snout somewhat pointed, short, rather shorter than the eye. The soft dorsal and anal fins obtusely rounded. Body of a nearly uniform olive-colour (in spirits), the scaly sheath of the dorsal fin yellow; each scale with an indistinct violet spot at the base. The ocular band commences in front of the first dorsal spine, is narrower than the orbit, and edged with yellow. It is still narrower below the orbit and also paler, but extends over the interoperculum. Caudal fin without any markings. The soft dorsal and anal with a narrow black and white margin, and slightly powdered with black within the margin. The smaller specimen appears to have had a round blackish spot between the seventh and thirteenth dorsal rays close to the margin of the fin.

Two specimens were sent by Dr. A. B. Meyer from Manado; the larger is 5, and the smaller 4 inches long.

SEBASTES RHODOCHROUS.

D. $11\left|\frac{1}{9}\right.$. A. $\frac{3}{5}$. L. lat. ca. 48.

The height of the body is one third of the total length (without caudal), the length of the head one half. Interorbital space deeply concave, very narrow, its width being only one third of the diameter of the eye. Snout longer than the eye, which is one fourth of the length of the head. Spines of the head prominent and acute. Supraorbital margin with one spine in front and two behind. No groove on the occiput. Infraorbital with a single ridge armed with four spines. Occiput naked; opercles and cheeks scaly. The palatine teeth form a narrow band. Dorsal spines strong, the third, fourth, and fifth are the longest, but only a little longer than the eye; the eleventh considerably shorter than the twelfth. The second anal spine is stronger and longer than the third, and one third of the length of the head. The pectoral fin extends to the anal. Caudal fin truncated. Red, the upper parts of the fish irregularly marbled with blackish. A large black spot between the seventh and tenth dorsal spines on the base. All the other fins nearly uniform red. Pharynx with scarcely any blackish spots.

Two specimens were obtained by Dr. A. B. Meyer at Manado; the larger is 8 inches long.

AGRIOPUS TORVUS (Gronow).

This fish is figured in 'Arcana, or the Museum of Natural History,' under the name of *Congiopodus percatus*. As this work appears to have been issued in or about the year 1811, it is a question whether the generic name of *Congiopodus* should not have priority before *Agriopus*, Cuvier, 1829. After some consideration I came to the conclusion that the generally adopted nomenclature should not be disturbed in this case, for the following reasons:—

1. The 'Arcana' shows on every page evidence of its unscientific character; it was a production of a very inferior kind even for the early period in which it made its appearance. The way in which it was published appears to have been very irregular; no name of a responsible editor or author appears on the titlepage; "Editors" are mentioned in the introduction, and the dedicatory notice is signed "G. Perry," who, I believe, was an artist, but not a naturalist. Thus we are left in ignorance as regards the authorship of the new names employed in the book.

2. Although the figure of "*Congiopodus percatus*" is recognizable, no proper characters of the genus are given; after having made a few insignificant remarks about the fish, the author of the article runs off into considerations of the organization of fishes generally.

3. It will be difficult to discover the etymology of the term "*Congiopodus*." Even if intended for "*Conchopodus*," or "*Coniopodus*," the term is without any meaning when applied to *Agriopus*,

and therefore, n my opinion, ought to be sunk into the synonymy or, better, forgotten.

HOLOCENTRUM MICROSTOMA, Günth. Fish. i. p. 34.

There are several examples in the Godeffroy collection from the Samoa and Tonga Islands. The spot in front of the spinous dorsal is larger than in the typical specimens, where it has partly disappeared from the long period during which they have been preserved in spirits. The spot is in the form of an oblique black band. I think that *H. tahiticum*, Kner (Novara, Fisch. p. 9), is not specifically distinct from this species. (The figure given by Kner represents *H. sammara.*)

HOLOCENTRUM DIPLOXIPHUS. (Plate LX.)

D. 11/13. A. 4/9. L. lat. 45–49. L. transv. $3\frac{1}{2}/8$.

The height of the body is equal to the length of the head, and one third of the total (without caudal). The interspace between the eyes is flattish, its width being somewhat less than the diameter of the eye, and two sevenths of the length of the head. The length of the groove for the processes of the intermaxillaries is two thirds of the diameter of the eye. Length of the snout about three-fifths of the diameter of the eye; the maxillary does not extend to below the middle of the orbit. *Suprascapula serrated.* Operculum with two prominent flat spines subequal in size. *The præopercular spine is broad, flat, dagger-shaped, projecting far beyond the margin of the gill-opening, its length being two thirds of the diameter of the eye. Dorsal fin elevated*; the third, fourth, fifth, and sixth spines are the longest, half as high as the body. Third anal spine very strong, two thirds of the length of the head, or two ninths of the total length (without caudal). Caudal moderately forked, with the lobes rounded. Ventral fins terminating at a great distance from the vent. In the *adult* the upper parts and sides are of a rose-colour, which gradually passes into the silvery coloration of the lower parts; some parts of the back are minutely and indistinctly punctulated with brown. Vertical fins with a reddish tinge; the spinous dorsal with a broad yellowish margin; and a series of very indistinct rounded darker spots along its upper half. In a half-grown example the head and body are densely punctulated with brown; the upper parts being of a greyish green, with two large whitish blotches. The anterior blotch occupies the space below the second half of the spinous dorsal, the posterior is below the end of the soft dorsal. The spinous dorsal fin with a curved series of large roundish blackish spots, the upper part of the fin being of a yellowish colour.

Two specimens from the Godeffroy collection; the larger is $5\frac{1}{2}$ inches long, the smaller $3\frac{1}{2}$ inches. Samoa Islands.

ACANTHURUS ATERRIMUS.

D. $\frac{9}{31}$. A. $\frac{3}{28}$.

The height of the body is contained once and two thirds in the total length (without caudal). Eight lobate incisors in the upper jaw, and ten in the lower. Anterior profile of the snout slightly concave. The distance of the nostril from the edge of the upper jaw is two thirds of the length of the head. Dorsal and anal fins rounded behind; caudal deeply forked, with the lobes pointed. Deep black; a ring round the lower jaw, the opercular membrane and the outer ventral ray bluish. Hind margin of the caudal with a lighter-coloured crescent.

One specimen, 3½ inches long (no. 56), from the Godeffroy Museum; it was obtained at Savay (Samoa Islands).

CUBICEPS MULTIRADIATUS. (Plate LXI.)

D. $10|\frac{1}{25}$. A. $\frac{3}{25}$. L. lat. 60. L. transv. 8/22.

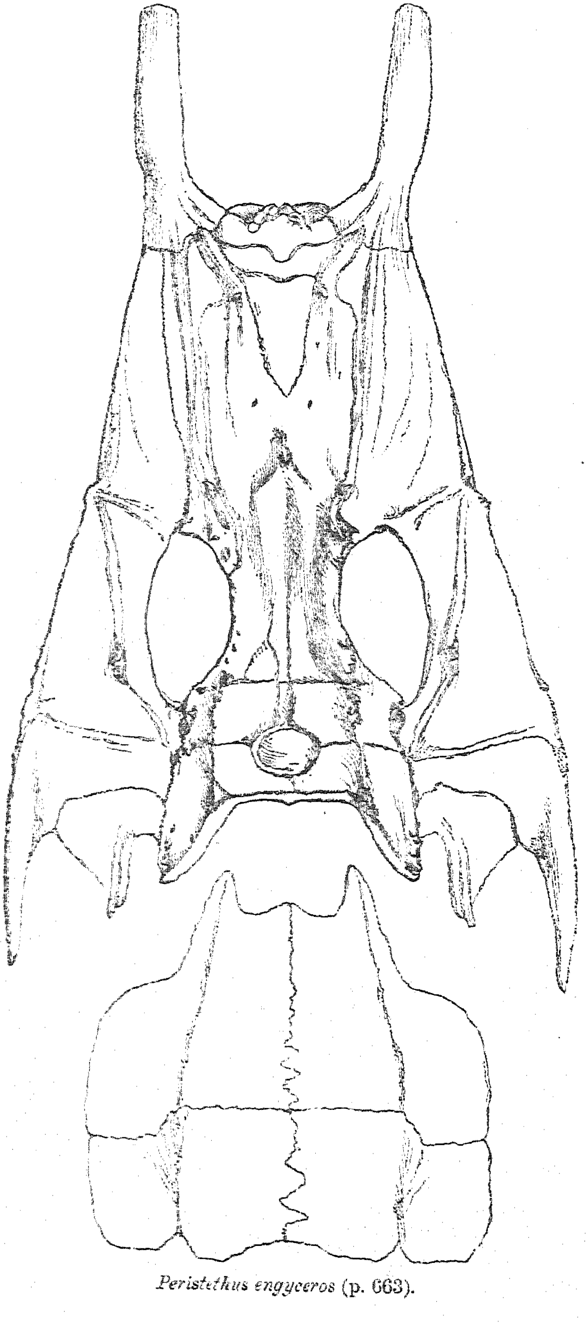
The height of the body is contained twice and one fifth in the total length (without caudal), the length of the head thrice and a half. Abdomen not compressed into a ridge; ventral fins received in a groove. The eye occupies nearly the middle of the depth of the head; its diameter equals the length of the snout, and is one fourth of that of the head. Jaws with a series of very small teeth. The vomer and tongue are armed with a narrow band of minute teeth; no palatine teeth. Maxillary hidden below the præorbital, and extending to the front margin of the orbit. Pectoral fin rather longer than the head, and extending considerably beyond the origin of the anal. Ventral fin two fifths as long as the pectoral. Caudal fin deeply forked. Light brownish, with a silvery tinge; a blackish stripe along each series of scales. Fins black, except the pectoral; inside of the mouth and gill-cavity flesh-coloured.

One specimen, 6 inches long, has been sent from Manado by Dr. A. B. Meyer.

PLATYCEPHALUS CINEREUS.

D. 1|7|12. A. 12. L. lat. 120.

The length of the head is two sevenths of the total (without caudal), its width between the præopercular spines is contained once and three fourths in its length. Upper surface of the head smooth, without spines, except a minute one in front of the eye. Præopercular spines short, subequal in length, or the lower somewhat the longer. The teeth of the maxillary are villiform, forming a broadish band with two pairs of distinct canine teeth behind on the side of the symphysis. The mandibulary and palatine bands are much narrower, with a series of longer conical teeth. Vomerine band continuous, crescent-shaped, narrowest in the middle, broadest towards each extremity, where also some larger conical teeth are mixed with the villiform teeth. Interorbital space but slightly concave, scaly, its width being equal to the diameter of the eye, which is contained twice and one third in the length of the snout. Eye without tentacle. The isolated dorsal spine short and stiff. Upper parts nearly uniform blackish ash; dorsal fins without spots, transparent; caudal



Peristethus engyceros (p. 663).

mottled with black, without bands; pectoral and ventral fins brown, with whitish reticulations.

Length of a single specimen 14½ inches. South Australia.

Dactylopterus orientalis.

Young examples have been described by Dr. Bleeker under the name of *D. chirophthalmus* (Nat. Tyds. Ned. Ind. vii. 1854, p. 494).

Peristethus liorhynchus. (Plate LXII.)

D. $7 \big| \frac{1}{18}$. A. 21. L. lat. 34.

Præorbital processes of moderate width, their length being one third of the distance between their extremity and the front margin of the orbit. Snout and forehead without any spines; also the præopercular ridge does not terminate in a spine. Interorbital space concave, its width being equal to the diameter of the eye. Anterior abdominal scutes considerably longer than broad, and much larger than the posterior, which are broader than long. Red, coarsely reticulated with blackish. The dorsal, anal, and pectoral fins with a black margin.

One specimen, 8⅓ inches long, was obtained by Dr. A. B. Meyer at Manado.

Peristethus engyceros. (See woodcut, p. 662.)

Præorbital processes *narrow*; their length is contained twice and three fourths in the distance of their extremity from the orbit. Snout with three spines above; four or five similar spines in front of the upper part of the orbit. Præopercular spine nearly as long as præorbital process, subcylindrical, acutely pointed. Interorbital space concave, its width less than the vertical diameter of the orbit. There are also some small spines on each side of the crown of the head. Anterior ventral plates rather longer than broad, posterior nearly twice as broad as long.

I have seen only the fragments of a dried example of this new species; it was sent by Harper Pease, Esq., from the Sandwich Islands.

Gobius mucosus. (Plate LXIII. fig. A.)

D. $6 \big| \frac{1}{11}$. A. 10.

The scales are very small and hidden below a thick mucous covering, which envelops all parts and forms on the snout and sides of the head transverse and longitudinal ridges. The height of the body is one fifth of the total length (without caudal), the length of the head two sevenths. Head rather depressed, its depth being one half of its length. Snout moderately produced, the posterior margin of the orbit occupying nearly the middle of the head. The diameter of the eye equals the width of the interorbital space, and is one fifth of the length of the head. Mouth small, subvertical, the angle of the mouth being at a considerable distance from the eye. Teeth very small, in bands, without canines. Dorsal and anal fins not elevated. Caudal pointed, longer than the head. The pectoral extends to the origin of the soft dorsal, the ventral terminates at some distance from the vent. The body appears to have been subreticulated with blackish. Rays of all the fins, except the ventrals, with blackish spots.

One specimen, 3⅓ inches long (no. 413), from the Godeffroy Museum; it was obtained at Adelaide.

Gobius platystoma. (Plate LXIII. fig. B.)

D. 6|10. A. 9. L. lat. 60.

Allied to *Gobius platynotus*, but with a very broad and angular snout. Twenty longitudinal series of scales between the origin of the posterior dorsal fin and the anal. Head and anterior part of the body broad and rather depressed. The broad rounded snout projects somewhat over the large mouth. The height of the body is one fifth of the total length (without caudal), the length of the head nearly one fourth. Eye small, only half the width of the interorbital space. The maxillary extends to below the hind margin of the orbit. Canine teeth none. Head entirely naked. Dorsal and anal fins low; caudal obtusely rounded. Ventral short, not adherent to the belly, terminating at a great distance from the vent; its basal membrane is well developed. The free portion of the tail is scarcely longer than deep. Brownish, with some indistinct darker spots. The spinous dorsal with a black spot behind.

One specimen, 2 inches long (no. 289), from the Godeffroy Museum. It was obtained at Port Mackay, North-eastern Australia.

Gobius leucostictus. (Plate LXIII. fig. C.)

D. 6|12. A. 11.

Scales minute. The height of the body is one sixth of the total length (without caudal), the length of the head one fourth. Head rather compressed; eyes very close together, obliquely directed upwards, of moderate size, their diameter being one fifth of the length of the head. Snout very short, obtuse; mouth oblique, extending to below the middle of the eye; jaws even in front. Head and foremost part of the trunk scaleless. Dorsal and anal fins lower than the body; caudal somewhat pointed, longer than the head. The ventral fin terminates at a great distance from the vent, the pectoral extends to the end of the spinous dorsal. Greyish, with irregular dark cross bars on the back; sides and lower parts covered with small round whitish spots and dots. The spines and rays of the dorsal with black spots arranged in oblique series; on the anal the black spots are confluent across the interradial membrane, forming oblique bands; caudal with six black cross bands. Ventral with black and white spots.

One specimen, 2⅔ inches long (no. 429), from the Godeffroy Museum. Tonga Islands.

Gobius elapoides. (Plate LXIII. fig. D.)

D. 8 | 21. A. 20. L. lat. 110.

Body compressed, its depth being contained four times and two thirds in the total length (without caudal), the length of the head thrice and three fourths. Head naked, the scales from the nape advancing only as far as the eye. Snout longer than the eye, which is obliquely directed upwards, and nearly one fifth of the length of the head. Jaws even in front; the maxillary extends to below the anterior margin of the orbit. Teeth moderately strong, not quite equal in size, but none of them can be called canines. The middle dorsal spines are produced; caudal fin rounded, shorter than the head. Body with seven narrow dark-brown rings edged with white. The first and second correspond to the commencement and end of the spinous dorsal; the three following to the second dorsal fin, on the base of which they form three ocelli; the sixth round the caudal peduncle, and the seventh on the base of the caudal fin. A similar ring crosses the orbits and cheek. A straight brown stripe ascends from the eye to a spot on the nape of the neck.

One specimen, 3½ inches long, has been obtained by A. Adams, Esq. As it was in a bottle containing reptiles and fishes from the Japanese region, it is probable that this Goby inhabits some part of those coasts.

Callionymus cookii.

D. 4 | 8. A. 7.

Gill-opening a small foramen on the side of the neck; extremity of the operculum produced backwards. The præopercular spine is straight, slender, considerably longer than the eye, with six or seven small barbs curved upwards and inwards; no barb at the base of the spine. Head much depressed, its length being contained thrice and two thirds in the total (without caudal). A longitudinal fold of the skin along each lower side of the abdomen and tail. *Male*:—The first dorsal spine and the last ray of the soft dorsal and anal produced. Upper parts of the body with dark transverse bands and markings, the lower with small blue ocelli. The soft dorsal with oblique dark bands and blue ocelli; anal with longitudinal series of blue ocelli in its basal half, and with a black spot between the ends of the sixth and seventh rays; this black spot is again ornamented with blue ocelli. Caudal fin with dark cross bands, its lower half ocellated with blue.

One specimen, 3¼ inches long (no. 260), from the Godeffroy Museum; it was obtained at Rarotonga, Cook's Islands.

Patæcus subocellatus. (Plate LXIV.)

D. 39. A. 15. C. 10. P. 8.

The first dorsal spine very short, the second is the longest, as long as the head. The interradial membrane of the anal fin is so narrow that the fin cannot be erected; and the last ray is attached to the lower edge of the tail. The three upper pectoral rays much shorter than the fourth. No orbital rim. Skin entirely smooth, without tubercles or tentacles. Four ocellated spots, about as large as the eye, and the anterior equidistant from each other, along the upper half of the body. Fins indistinctly reticulated with brown, some of the reticulations being distinct rings.

South Australia.

MYXUS LEUCISCUS. (Plate LXV. fig. A.)

D. $4 \mid \frac{1}{8}$. A. $\frac{3}{10}$. L. lat. 47. L. transv. 14.

Teeth small, movable, bent, those of the upper jaw in a single series; a deep notch in the middle of the upper jaw to receive the mandibulary symphysis. Lower jaw with a similar series of horizontal teeth; other smaller teeth appear to be destined to replace those in function. Lower surface of the mandible without transverse folds. Palate apparently toothless. The maxillary does not quite extend to the front margin of the eye. Snout pointed and rather longer than the eye, which is one fourth of the length of the head, and only two thirds of the width of the interorbital space. The depth of the body is scarcely more than the length of the head, which is one fourth of the total length (without caudal). Pectoral extending to the commencement of the spinous dorsal, which corresponds to the fifteenth scale of the lateral line. Dorsal spines rather feeble, the first, which is the longest, being not quite half as long as the head. Caudal fin emarginate. Coloration uniform, back greenish.

One specimen, 5½ inches long (no. 273), from the Godeffroy Museum; it was obtained at Rarotonga, Cook's Islands.

CHILINUS GODEFFROYI. (Plate LXVI.)

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 21.

The height of the body is nearly equal to the length of the head, and two fifths of the total (without caudal). Head longer than high; snout compressed, rather pointed, its length being two fifths of that of the head. Chin not prominent. Scales on the cheek in two series, the lower of which is composed of three or four scales, and does not extend on to the præopercular limb. Caudal fin rounded. Tubules of the lateral line simple. Most of the scales with a well-defined deep-brown vertical streak; two parallel brown lines across the præorbital, two other similar lines behind, and one above, the eye. Vertical fins with brown reticulations; a white spot on the base of the last dorsal and anal rays.

One specimen, 5½ inches long (no. 440), from the Godeffroy Museum; it is from the Tonga Islands.

PLATYGLOSSUS NIGROMACULATUS. (Plate LXV. fig. B.)

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28.

The height of the body is one third of the total length (without caudal), and a little more than the length of the head. Snout pointed, somewhat longer than the eye, which is two ninths of the length of the head. Caudal fin rounded. Greyish (in spirits), head and body densely covered with deep-black spots about as large as the eye; an immaculate stripe along the uppermost part of the back and the base of the anal. A series of round black spots along the base of the dorsal and anal fins; caudal fin nearly without markings.

One specimen, $2\frac{1}{2}$ inches long (no. 67), from the Godeffroy Museum; it was obtained at Savay (Samoa Islands).

PLATYGLOSSUS NOTOPSIS, Blkr.

We have received from the Godeffroy Museum a specimen from Savay of a uniform black colour; however, the two ocelli on the dorsal fin are present, and it has also thirteen soft dorsal rays, so that it must be regarded as merely a variety.

HEMICHROMIS SUBOCELLATUS. (Plate LXVII. fig. C.)

D. $\frac{14}{8}$. A. $\frac{3}{7}$. L. lat. 25. L. transv. $2\frac{1}{2}/10$.

The height of the body is two sevenths or one third of the total length (without caudal), the length of the head one third. Snout as long as the eye, the maxillary extending to the vertical from the front margin of the orbit. Three series of scales on the cheek. Front teeth of the upper jaw not enlarged. The spinous dorsal fin is rather low, the longest spine being not much more than one third of the length of the head. The soft dorsal and anal sometimes produced into a filament. Brown, operculum with an indistinct blackish spot. The following ocellated spots may be present or absent:—one on the middle of the anterior soft dorsal rays, and one or two on the upper caudal rays. The remainder of the caudal and the anal blackish, with yellowish specks.

Gaboon. Three specimens, $2\frac{1}{2}$ inches long, are in the possession of the author, and will be deposited in the British Museum.

BLENNODESMUS, g. n. LYCODID.

Body elongate, compressed, band-like, rudimentary scales being imbedded in the mucous integuments of the body. Lateral line rather indistinct. Eye of moderate size. Head compressed, with the snout pointed and the lower jaw prominent. Small conical teeth in both jaws; palate smooth. Barbels none. Gill-openings and vertical fins as in the other genera of this family. Ventral fins reduced to two small and short filaments, jugular. No prominent anal papilla.

BLENNODESMUS SCAPULARIS. (Plate LXVII. fig. A.)

D.+C.+A. 50+9+40. V. 1.

The height of the body is one twelfth of the total length (without caudal), the length of the head one seventh. Interorbital space convex, much narrower than the eye, the diameter of which is one fifth of the length of the head; snout pointed, compressed, rather longer than the eye. The maxillary extends beyond the front margin of the orbit. The vent is twice as distant from the extremity of the caudal as from the snout. The dorsal fin commences above the posterior half of the pectoral, and is lower than the body; caudal fin rounded. The anal commences immediately behind the vent. Pectoral half as long as the head. Ventrals close together, reduced to a pair of fine filaments about as long as the eye. Body brownish, marbled with darker, sides of the head with small round yellowish spots; *a black yellow-edged ocellus in the scapulary region*; an undulated yellowish line along the middle of the nape and head; fins greyish.

One specimen, 3 inches long (no. 364), from the Godeffroy Museum; it was obtained at Port Mackay (North-east Australia).

HALIDESMUS, g. n.

This genus may be referred to the group *Brotulina*, of the family *Ophidiidæ*.

Body elongate, compressed, band-like, covered with minute scales, and with three lateral lines on each side. Eye of moderate size. One long dorsal and anal, not continuous with the caudal. Ventrals reduced to a pair of short filaments, close together, scarcely in front of the pectorals. A series of conical teeth in each jaw, none on the palate. Lower jaw somewhat projecting beyond the upper; barbels none. Six branchiostegals; gill-opening wide; pseudobranchiæ none. No anal papilla.

HALIDESMUS SCAPULARIS. (Plate LXVII. fig. B.)

D. 64. A. 48. C. 11. V. 2.

The height of the body is one sixteenth of the total length (without caudal), the length of the head one tenth. Snout as long as the diameter of the eye, which is one fifth of the length of the head. The maxillary does not extend to below the middle of the eye; mandibulary joint below the posterior margin of the orbit. The teeth are comparatively strong; there are a few smaller ones behind the principal series with which each jaw is armed. Beside the lateral line which runs along the median line of the fish, there is another along the base of the dorsal fin, and a third along the base of the anal. The latter is split up into two branches opposite to the vent, one branch following the median line of the abdomen, and the other running along the side of the abdomen; the two branches are reunited below the pectoral. The vent is twice as distant from the root of the caudal as from the end of the snout. The dorsal fin commences above the extremity of the pectoral, is not quite as high as the body, and subcontinuous with the caudal. Caudal fin rounded, nearly as long as the head. The anal fin is distinctly separated from the caudal. Pectoral fin well developed, as long as the postorbital part of the head. Each ventral reduced to a very small and short filament, which, however, contains two rays. Brown, fins black; an ovate deep-black spot in the scapulary region, above the pectoral fin.

Two specimens, 5 inches long, formed part of a collection from Port Elizabeth (Port Natal). Purchased.

PSEUDOPHYCIS PEREGRINUS.

D. 7 | 62 (ca.). A. 66 (ca.). V. 3.

The height of the body is less than the length of the head, which is two ninths of the total (without caudal). Vent at only a short distance behind the base of the pectoral; tail tapering into a very narrow band, the extremity of which is surrounded by the caudal fin; however, the vertical fins remain separate from one another. Head rather broader than deep, its greatest width being two thirds of its length. Interorbital space concave, its width being less than the diameter of the eye, which is one fourth of the length of the head, and equals that of the snout. Snout broad, obtuse, rounded, with the upper jaw overlapping the lower; the maxillary extends to below the middle of the eye. Barbel shorter than the eye. Vertical fins of moderate depth, with very fine fin-rays; the first dorsal commences opposite to the base of the pectoral. Pectoral as long as the head without snout. The ventral filament is jugular, extending beyond the origin of the anal, and composed of one longer and two shorter rays. Scales minute and deciduous. Reddish olive (in spirits), abdomen black.

Dr. A. B. Meyer has sent several examples from Manado; but they were so soft and decomposed that only one could be saved for description and preservation. It is 5 inches long. These fishes live evidently at great depths, which accounts also for the bad state in which they arrived, as it is most difficult to preserve deep-sea fishes after they have been removed from the condition of atmospheric pressure to which they were exposed. Also the stomach is protruding into the mouth, a common occurrence in fishes taken from great depths, and provided with an air-bladder.

The discovery of this fish is of the greatest interest, inasmuch as it is the first instance of a true Gadoid being found in the East-Indian archipelago, *Bregmaceros* being a much less typical form of this family. The distribution of ichthyic types at great depths is very different from that on the surface of the oceans; and in elucidating the facts of the geographical distribution of marine fishes, it is as important to distinguish between the vertical faunæ as between the horizontal.

The two other species of *Pseudophycis* known inhabit the coasts of New Zealand and South Australia.

NANNÆTHIOPS (g. n. TETRAGONOPTERIN.).

Dorsal fin placed in the middle of the length of the body, above the ventrals; anal short. Adipose fin small. Body of moderate depth, covered with scales of moderate size. Belly rounded. Lateral line present. Cleft of the mouth narrow; teeth small, in a single series in both jaws, with a simple notch. Maxillary and palate toothless.

NANNÆTHIOPS UNITÆNIATUS. (Plate LXV. fig. C.)

D. 13. A. 9. L. lat. 35. L. transv. 5/7.

The height of the body is contained thrice in the total length (without caudal), the length of the head thrice and two thirds. Snout short, shorter than the diameter of the eye, which is one third of the length of the head, and equal to the width of the interorbital space. Maxillary very short, scarcely extending to the front margin of the orbit. Intermaxillary with about nine simply notched teeth on each side; teeth of the lower jaw smaller. The origin of the dorsal fin is midway between the end of the snout and root of the caudal, which is forked. Anal short and low. The root of the ventral is vertically behind the origin of the dorsal. Brownish, with a narrow black band running along the side below the lateral line.

Gaboon. Several specimens, from 2 to 2½ inches long, are in the author's possession, and will be deposited in the British Museum.

MORMYRUS LEPTURUS. (Plate LXIX. fig. B.)

D. 19. A. 24. L. lat. 44.

Snout very obtuse, with the mouth terminal, and the upper profile somewhat more curved than the lower; upper jaw slightly overlapping the lower. Eye small, shorter than the snout, situated before the middle of the length of the head. Teeth small, deeply notched, few in number. Pectoral shorter than the head, extending to the middle of the ventral, which is only half as long. The height of the body is two sevenths of the total length (without caudal), the length of the head two ninths. The caudal peduncle is longer than the head, and very slender, its depth being one third of its length. Brown, head blackish. Two black vertical bands descend from the origin and end of the dorsal fin to the anal.

Gaboon. Two specimens, 3 inches long, are in the possession of the author, and will be deposited in the British Museum.

BELONE PUNCTULATA.

D. 21. A. 21.

The free portion of the tail is slightly compressed, rather deeper than broad; *the lateral line terminates in a distinct keel, which is not coloured black*. The length of the head is contained twice and four fifths in the total (without caudal); a deep median groove runs along the median line of the forehead; crown of the head flat. *Maxillary entirely hidden* by the præorbital. The greatest depth of the body is but little less than the length of the postorbital portion of the head. Teeth of moderate size; vomerine teeth none; tongue smooth. The diameter of the eye is two thirds of the width of the interorbital space, and contained twice and two thirds in the length of the postorbital portion of the head. Ventral fin nearly midway between the base of the caudal and the centre of the eye. Posterior dorsal and anal rays shortest, terminating at some distance from the caudal; anterior rays of moderate length. Caudal fin forked. Scales not very small. Upper parts green, sides and lower parts silvery, *with numerous brown dots*.

One example, 23 inches long, has been obtained by Dr. B. Meyer at Manado.

HEMIRHAMPHUS ACUTUS.

D. 13. A. 17. L. lat. 53.

The length of the head is somewhat more than one third of the total (without caudal), the length of the lower jaw (beyond the extremity of the upper jaw) a little more than one half of the length of the head. The triangular part of the upper jaw formed by the intermaxillaries is rather longer than broad. The diameter of the eye is a little less than the width of the interorbital space, and contained once and two thirds in the length of the postorbital portion of the head. Vertex and interorbital space flat. The base of the ventral fin is midway between the root of the caudal and the gill-opening. Dorsal and anal fins scaleless, nearly equally long; the dorsal commences a little in advance of the anal. Caudal fin forked, the lower lobe being the longer; its central rays longer than the eye. Sides with a well-defined silvery stripe.

One specimen, 6 inches long (no. 264), from the Godeffroy Museum. From Rarotonga, Cook's Islands.

HEMIRHAMPHUS GAMBERUR (Rüpp.).

Having received specimens of this species through the kindness of the Marquis J. Doria, I am enabled to point out the characters by which it is distinguished from *H. dussumieri*.

D. 14. A. 14. L. lat. 50.

Body subtetrahedral. The length of the entire head is twice that of the lower jaw, and one third of the total (without caudal). The triangular part of the upper jaw, formed by the intermaxillaries, is broader than long. The diameter of the eye equals the width of the interorbital space, and is two thirds of the length of the postorbital part of the head. The root of the ventral fin is somewhat nearer to the head than to the base of the caudal. Dorsal and anal fins scaly, the former rather longer than the latter. Caudal fin deeply forked, the central rays about as long as the eye. Sides with a well-defined silvery band.

Red Sea.

ENGRAULIS BŒLAMA (Forsk.).

B. 11–12. D. 15. A. 29–32. L. lat. 36–42.

The height of the body is one fourth or two ninths of the total length (without caudal), the length of the head one fourth or rather more than one fourth. The depth of the head is three fifths of its length. The diameter of the eye is a little more than the length of the snout, and two ninths of that of the head. Snout obtusely conical, much projecting beyond the lower jaw. Minute teeth in both jaws. The maxillary becomes gradually broader, and is obliquely truncated behind; it extends to or slightly beyond the mandibulary joint. Gill-rakers closely set, the longest nearly as long as the eye; there are thirteen in the upper part of the branchial arch, and from twenty-two to twenty-four in the lower. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. The anal fin commences at a short distance behind the last dorsal ray. Abdomen trenchant, with the spiny scutes scarcely extending to the root of the pectoral fins. Pectoral fins not quite reaching the ventrals. Back bluish green, sides silvery.

Red Sea, Zanzibar, Mysol, Manado (*Meyer*).

CLUPEA SPRATTUS.

The British Museum has recently received four Clupeoids from Tasmania, through the kindness of Mr. Morton Allport. They were accompanied with the following notes from 'Papers and Proceedings of the Royal Society of Tasmania' for May 1867:—

"A note from Mr. Calder, containing the following extract from a letter received by him from Bruni Island was read:—'Last week a curious circumstance took place in Simmon's Cove. An immense shoal of small fish of the Sprat kind (?) was driven into the Cove by larger kinds, such as the Barracouta, Kingfish, and others, in such numbers that they absolutely suffocated each other, and drifted ashore in such quantities that you will hardly believe me when I tell you there are at least one hundred tons there, and fully two hundred more at the bottom of the water, all dead. They are now quite putrid, and the smell can be perceived fully a mile and a half off. The top of the water is covered with a quantity of oil which has exuded from the dead fish. We are longing for a high tide to carry them away. Many carts and boats have been at work, taking them for manure, yet they appear no less in quantity. I have been calculating that, supposing four of these fish to weigh one ounce, the number of the dead will amount to forty-three millions and eight thousand.'

"Mr. M. Allport observed that a similar migration of these fish to our shores had taken place in 1844, and numbers of them passed far up the Derwent. They represented the Pilchard of the Northern Hemisphere, and were, no doubt, identical with those which had lately visited Port Phillip. Although they were the representatives of the Pilchard, it was possible some slight traces of difference existed between them, as was generally the case with all representatives of animals in the two hemispheres."

The four Clupeoids sent belong to two distinct species. The one is the variety of the common European Anchovy which I have described as *Engraulis encrasicholus*, var. *antipodum*. The second is the common European Sprat, *Clupea sprattus*. At first I thought the Tasmanian fishes might be distinguished from the European form by the apparent absence of palatine teeth; but during a more careful examination I found these teeth as well developed as in *Cl. sprattus*, so that I cannot hesitate to refer them to the same species.

A Pilchard, or a species representing the Pilchard, was not among the fishes sent by Mr. M. Allport; but it is very probable that the Pacific Pilchard (*Cl. sagax*) occurs in Tasmanian waters.

Attempts ought to be made to utilize the Tasmanian Anchovy and Sprat in the same way as it is done in Europe.

The occurrence of many European marine fishes in Tasmania is a fact of great interest in geographical distribution. I have now examined Tasmanian specimens of the European Maigre (*Sciæna aquila*), John Doree (*Zeus faber*), Horse-Mackarel (*Trachurus trachurus*), Sprat (*Clupea sprattus*), Anchovy (*Engraulis encrasicholus*), Conger (*Conger vulgaris*), Sunfish (*Orthagoriscus mola*), Angelfish (*Rhina squatina*), Blue Dog (*Galeus canis*), Spiny Dog (*Acanthias blainvillei*), &c. To account for this singular fact it is not necessary to assume that a change of the geographical distribution of these fishes at a former period has taken place, in consequence of physical changes on the globe's surface. It is quite possible that there still exists a continuity of the species at the present period, but that these fishes, which are more or less surface fishes in temperate latitudes, live at much greater depths in the tropical zones, and, therefore, have hitherto escaped observation.

ANGUILLA OBSCURA.

Allied to *A. latirostris*. The length of the head is two thirds of the distance of the gill-opening from the origin of the dorsal fin, and one half of its distance from the vent. Lips rather broad; lower jaw scarcely prominent. Teeth equally small, in bands of moderate width. Angle of the mouth below the hind margin of the eye, which is rather small. Tail rather longer than the body. Upper parts uniform dark coloured.

One specimen, 14½ inches long (no. 448) from the Godeffroy Museum; it was obtained in fresh water of Kanalhia, Feejee Islands.

PŒCILOCONGER (g. n. ANGUILLIN.).

Scaleless. Head pointed, without muciferous cavities. Cleft of the mouth of moderate width, extending to below the eye. All the teeth villiform, forming bands. Pectoral and vertical fins well developed, the dorsal commencing in advance of the gill-opening. Nostrils small, the anterior without tube. Eyes large, without orbital fold.

PŒCILOGONGER FASCIATUS. (Plate LXVIII.)

Tail longer than the body, which is compressed; the length of the head is contained once and two thirds in that of the trunk. Head narrow; snout pointed, one half longer than the eye. Lips thin; angle of the mouth below the middle of the eye. Teeth in narrow bands, the vomerine band only half as long as the maxillary. Gill-openings as wide as the orbit, rather close together, not extending upwards above the pectoral. The dorsal rays are not quite so high as the body, but much higher than the anal rays; the length of the pectoral two sevenths of that of the head. Purplish brown; head with large round brown spots; trunk with five, tail with six brown cross bands, broader than the interspaces, and the middle ones the broadest; they extend on the dorsal fin. Dorsal fin with longitudinal lines, anal with a darker margin.

One specimen was sent from Manado by Dr. A. B. Meyer; it is nearly 12 inches long, viz. head 1 inch 11 lines, trunk 3 inches 3 lines, and tail 6 inches 9 lines.

MURÆNA CHILENSIS.

Teeth of moderate size, acute; those of the maxillary and the anterior of the mandible biserial, the others uniserial. The jaws can be shut completely. Snout of moderate length, subconical. Eye small, somewhat nearer to the end of the snout than to the corner of the mouth. Nasal tubes short; cleft of the mouth of moderate width, its length being less than two fifths of that of the head. Gill-opening narrow. Dorsal fin low. Tail considerably shorter than the body; the length of the head is nearly one third of that of the trunk. Coffee-brown, irregularly marbled with darker.

One specimen, 34 inches long (no. 144), from the Godeffroy collection. Chile.

MURÆNA TÆNIOIDES.

Dorsal fin elevated, the posterior rays being as high as, or higher than, the body underneath, commencing considerably in advance of the gill-opening. Teeth conical, acute, those of the maxillary in a double series; the mouth can be shut completely. The length of the anterior nasal tubes less than the vertical diameter of the eye. Snout obtusely conical, twice as long as the diameter of the eye, which is of moderate size and above the middle of the cleft of the mouth. Gill-opening not much wider than the eye. Tail rather longer than the body; the length of the head is one fifth of that of the trunk. Body and tail uniform light brownish; dorsal and anal with a white margin. Head with small black dots, more numerous towards the end of the snout.

One specimen, 15½ inches long (no. 53), from the Godeffroy Museum. From Savay.

TETRODON PLEUROSTICTUS. (Plate LXIX. fig. A.)

The lower side of the tail with a distinct ridge-like fold. The two nasal openings of each side are in a single papilla. The anterior part of the abdomen and sometimes the middle of the back of the trunk with minute spines, the remainder of the fish being entirely smooth. Snout short, its length being less than the width of the interorbital space. The length of the head equals its distance from the dorsal fin. Caudal fin truncate. Upper parts brown; sides greyish, gradually passing into the white of the lower parts. A series of three black round spots on each side of the body—the first corresponding to the upper posterior corner of the pectoral, the second below the end of the dorsal, and the third on the upper half of the tail, near the base of the caudal.

Two specimens, 3½ and 4 inches long (nos. 134 and 357), from the Godeffroy Museum; they were obtained at Port Bower and Port Mackay (N.E. Australia).

GEOTRIA ALLPORTI. (Plate LXX.)

Entirely black; skin with numerous transverse folds. Gular pouch large. The two middle teeth of the maxillary lamina are small, pointed, many times smaller than and entirely disconnected from the lateral, which are of a triangular shape and finely serrated on the inner margin. Mandibulary lamina very low, denticulated. Suctorial teeth in numerous series, rather distant from one another, unicuspid; only those nearest to the mouth somewhat larger, the others small. Form of the suctorial disk as in *G. australis*. Distance between the two dorsal fins less than the length of the first.

Tasmania, from fresh water. One example, 13 inches long, has been presented by Morton Allport, Esq.

2. Notes on the Raptorial Birds of India.

By A. ANDERSON, F.Z.S.

[Received October 23, 1871.]

I returned to India in October last, after a furlough of eighteen months, and through the kindness of my friend Mr. W. E. Brooks, of Etawah, who had a bird-skinner in readiness for me, was enabled to renew my favourite study immediately after my arrival at Futtehgurh. The following notes refer to the districts of Cawnpore, Etawah, Futtehgurh, Mynpoory, and Eta, or that portion of the Doab situated between the first-named district and Allygurh,—a country through which my duties required me to travel during the cold-weather months of 1870–71, viz. from November to 15th of April. The arrangement and nomenclature followed is that adopted by Dr. Jerdon in his 'Birds of India;' and the numbers used are the same as in that work. In some cases I have had recourse to the corrected synonyms as pointed out in Blyth's 'Commentary,' and published in 'The Ibis.'

1. VULTUR MONACHUS, Linn. (The Cinereous Vulture.)

This magnificent Vulture, though met with on several occasions in small parties of twos and threes, can hardly be said to be a common bird in this part of the country. It is a cold-weather visitant, arriving in November, and leaving again in March for its breeding-haunts.

On two occasions a pair of these Vultures allowed me to ride circuitously to within 40 yards of them, when engaged on a dead bullock, in company with *Gyps bengalensis* and *G. indicus*. On another occasion, one that had been well gorged on a human body, on the edge of the Cawnpore branch canal, allowed me to approach behind the bank to within 10 paces.

2. VULTUR CALVUS, Scop. (The Black Vulture.)

The Black or Turkey Vulture of Anglo-Europeans is by no means an abundant species. It is a permanent resident, breeding on high trees, by preference on the peepul (*Ficus religiosa*), and laying a single white egg, which, as far as my experience goes, is invariably unspotted. Mr. Hume states that he "rather suspects that these birds pair in the air" *. Such *may* be the case; but a pair of these Vultures in the cold season of 1867 built their nest on the very top of a gigantic tamarind tree, opposite my house at Fyzabad, and I witnessed them "in copulâ" *in their nest*, at daybreak every morning.

I have never seen more than two or three of these Vultures together; and a carcass may attract hundreds of *Gyps bengalensis* and *G. indicus* and only one of this species. It is a late breeder as compared with the former; and these two are the only Vultures that breed in the country to which these notes refer.

3. GYPS FULVUS, Gmel. (The Griffon Vulture.)

Seen occasionally. One shot and examined had a very fine ruff. I have also seen a much larger and paler bird, which may have been the one described by Mr. Hume as "*himalayensis*." My notes on these birds are, I regret to say, very meagre.

4. GYPS INDICUS, Scop. (The Long-billed Vulture.)

This species and the next are equally numerous.

5. GYPS BENGALENSIS, Gmel. (The White-backed Vulture.)

Abundant. Builds exclusively on trees, and seems to have a decided partiality for the burgot and peepul (*Ficus indica* and *F. religiosa*). It is the earliest breeder amongst our Indian Raptores. Several eggs were collected near Futtehgurh as early as the 15th of October last year; and though I added considerably to the numbers in the following month, they were all, with one exception, without any spots. Later in the season, I got an egg almost completely capped at the small end with rich purple-red; but, unfortunately, it contained a live chick.

A curious trait in the habits of this species, viz. that of breaking off green twigs with its beak for a nest-lining, does not appear to have been recorded before.

6. NEOPHRON GINGINIANUS, Lath. (The Indian Neophron.)

This useful though disgusting scavenger is universally distributed, and is to be found in the middle of towns, villages, and cantonments. As a rule, they commence to build early in March, and lay generally two eggs. I have, however, frequently found only one, although ample time was allowed for the second to be laid. On several occasions, I have found one egg well incubated, while the other was quite fresh. They vary considerably in shape, size, and extent of colouring, even those from the same nest never corresponding in these details. One of a pair in my collection is fully half an inch longer than its companion egg; and I have several that are quite up to the majority of the plates in 'Ootheca Wolleyana.'

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* Rough Notes, part i. p. 10.

Although the Neophron builds at times on cliffs and old ruins, in this part of the country they seem to prefer doing so on trees; and the nests that were examined by me this year were built alike on the mango, tamarind, peepul, and burgot. One of a pair that built close to my house was in the immature plumage, but I failed to discover whether it was the male or female.

I saw a pair of these birds quartering the rock-side at Aden when anchored off that fort; were they the African or Indian form? The Neophron copulates on the ground; and the operation is slow and tedious.

8. Falco peregrinus, Gmel. (The Peregrine Falcon.)

Generally distributed in suitable localities, and essentially a Duck-Hawk in this as well as in other countries.

The Bhyree is a cold-weather visitant to the plains of India, arrives in October and November, according to locality, and leaves again in April. I procured five specimens of this Falcon; and they were all, when shot, within sight of jheels or swamps. They have invariably allowed me to approach within easy shooting-distance, even when they were about to take a duck. The following extracts from my notebook, relating to this species, may not prove uninteresting:—

"Camp, Mynpoory, Jan. 7, 1871.—Shot a young male in the plain brown stage when sitting on the edge of a jheel. Crop contained part of a Teal. Weighed 1 lb. 10 oz., while a male *F. jugger* shot the same day weighed only 1 lb. 3 oz. The latter, however, was weighed on *an empty stomach.*"

"Camp, Futtehgurh district, Jan. 30, 1871.—Tent pitched on the edge of the Indurgurh jheel, which is actually alive with different kinds of Ducks, Waders, and Siberian Cranes (*Grus leucogeranus*). A charming place for an ornithologist! Late in the evening shot a mature female Peregrine from the bough of a huge peepul tree which overlooked the jheel. Weight 2 lb. 4¼ oz. Length 20, wing 15, expanse 44 inches. Cere, legs, and feet pale greenish yellow; eyelids very pale yellow, orbital space whitish, with a tinge of green; basal half of both mandibles pale blue, blackish at the point.

"Simultaneously with my shot, out flew another Falcon from the same tree, uttering a shrieking noise, and making several swoops at the wounded bird on the ground. It, however, proved to be a male Jugger, and not the pair to the Peregrine, which I was in hopes it would have turned out."

"Camp, Etawah district, Feb. 9, 1871.—Shot another fully mature female close to the canal this morning. She had just flown round a large grassy plain, striking terror into the Blue Rocks (*Columba intermedia*), and making the so-called Ortolans (*Calandrella brachydactyla*) rise in clouds like flights of locusts, and perched on a low thorny bush, where she was easily approached and shot.

Weight 1 lb. 14¼ oz. Length 19, wing 14 inches. Legs and feet yellow, with a slight tinge of green.

"The same morning I shot a female Jugger Falcon, as I was anxious to compare the two birds in the flesh. The two Falcons correspond exactly in linear dimensions; but there is a considerable difference in their weight, the latter being 4 oz. lighter than the former.

"Camp, Mynpoory Canal, March 16, 1871.—Encamped in a glorious place for Raptores. I had just bagged nine female *Sarcidiornis melanotus* (with one shot) for the use of my camp-followers, and was meditating whether it would be better to go after a Spotted Eagle which had just carried away a small fish from the edge of the water, or after a female Imperial in the *lineated* stage, when I observed a Falcon skim over the surface of the water like a flash of lightning, and settle on a piece of rising ground, from which eminence she might have taken her pick of almost any Duck or Wader in the Indian list. The whole feathered creation for miles round had apparently assembled at this jheel (one of the few containing water so late in the season) preparatory to making a final migration northwards. This bird, again, proved to be a fine adult female.

"Weight 2 lb. 3½ oz. Cere, gape, and orbital space lemon-yellow, with a tinge of green; basal half of both mandibles greenish horny, rest pale blue; irides dark hazel-brown."

"Futtehgurh, April 13, 1871.—My shikaree brought me an immature female this morning, shot on the banks of the Ganges, as he says, in the act of striking a Greenshank (*Totanus glottis*), which is likely enough, as the migratory Ducks have by this time left this part of the country.

"This Falcon is in rather an interesting stage, as she has three blue feathers on her back, which are quite conspicuous in the plain brown plumage.

"Weight 2 lb. 2 oz. Length 20·4; wing 14·3 inches. Legs and feet pale yellowish green; cere pale green, basal half of both mandibles pale bluish with a tinge of yellow; orbital space whitish, yellow at the angle of the eye."

It is very extraordinary that four out of five of these Peregrines (and I lost a wounded female besides), as also the only examples of *F. peregrinator* and *F. atriceps* obtained by me, should be females. I have observed the same preponderance of females over males in almost all the Raptorial birds collected by me; and when mentioning the circumstance to Mr. Brooks, he informed me that he had noticed the same thing.

9. FALCO PEREGRINATOR, Sund. (The Shaheen Falcon.)

The only specimen of this species obtained was shot late on the evening of the 25th of January last, just as she (sex determined by dissection) had missed her quarry, a Rose-headed Parrakeet (*Palæornis rosa*), and alighted on a lofty peepul tree.

I was returning to my camp, after a long and fruitless tramp after Raptores; and as it was close to this very place where, some two and a half months before, a beautiful female specimen of *Falco atriceps*, Hume, had been added to my list, I was on the *qui vive* in the fond hope that something would turn up before it got dark.

Small flights of Parrots (*Palæornis torquatus* and *P. rosa*) were winging their way in rapid succession to their favourite roosting-places, as is their wont at sunset, when to my delight a Falcon dashed into a small flock of the latter, within a few paces of my horse's head, and sufficiently close to startle the animal momentarily. My gun-bearers, as invariably happens in cases of emergency, had lagged about a hundred yards behind, or I could easily have jumped off my horse, and shot the Falcon on the wing. Thrice did she attempt to strike her quarry, and on each occasion the Parrots huddled together in the utmost terror and confusion, dropping, as if shot dead, into the high *ruhur* crop through which I was riding. As they emerged, the Falcon doubled back upon them, and having been foiled in her repeated attempts, betook herself to a neighbouring tree, whence I had no difficulty in bringing her down.

Length 17, wing 12¾ inches. Cere and base of bill greenish yellow, orbital space pale yellow; legs and feet bright yellow.

Had it not been for the friendly cover, and perhaps the noise made by me in calling for my gun, the Falcon would not have retired to roost supperless that night. I have since learned that this Falcon preys to a great extent on Parrots.

The Shaheen must indeed be a rare bird; for this is the only one seen by me during a tour of five and a half months, and it is no exaggeration to say that hardly a day passed without myself or collectors spending several hours in the field.

When on my voyage out from England, a Falcon was captured on board the Peninsular and Oriental steamer 'Golconda,' on the evening of the 18th of October last, off the Bombay coast (midway between Aden and that port), of which I noted down a description and measurements as well as circumstances would permit, considering the poor bird had a broken leg and was confined in a hen-coop. I have now no hesitation in considering this to have been a male *F. peregrinator*. It would have been very interesting to have compared this specimen with examples from the North-west Provinces; but unfortunately one of the ship's officers was an amateur ornithologist, and all my attempts to negotiate for the bird proved futile.

In like manner I lost two specimens of *Accipiter nisus* and one *Tinnunculus cenchris*, besides several small birds in the Mediterranean. The Bombay *F. peregrinator* wanted the rich ochreous colouring beneath, so conspicuous in *my* bird, and was certainly of a paler hue above.

9 *bis*. FALCO ATRICEPS, Hume*. (The Black-cap Falcon.)

This was another trophy obtained by me on the morning of the 16th of November last, just *five* days after going into camp. It was indeed a good beginning.

Weight 13½ oz. Length 17, wing 13½, expanse 40 inches. Feet and legs orange; cere and eyelids pale yellow; bill greenish at base, rest bluish horny; iris brown. The bird, a female, is now in the collection of Mr. Brooks, where it has been examined by Mr. Hume, who pronounced it to be "*F. atriceps.*"

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* See concerning this species Col. Delmé Radcliffe's remarks in 'Ibis,' 1871, p. 363.

Without venturing an opinion myself as to whether this Falcon is worthy of specific separation from the preceding species, I would remark that both Col. Delmé Radcliffe ('Field,' No. 969) and Mr. Brooks consider the so-called *F. atriceps* to be merely an accidental variety of *F. peregrinator*. Indeed the latter gentleman showed me a specimen in his collection which has one side of its head like *F. peregrinator* and the other like *F. atriceps*.

Mr. Brooks, I may observe, does not regard his opinion on the subject as possessing any weight, on account of the few specimens he has seen of these two birds; but Col. Radcliffe's is especially weighty, considering he has had more Indian Falcons through his hands than any other man.

Mr. Hume distinguishes this species from the other bird, both on account of its paler mantle and the absence of the rich ochreous colour below. When treating of *F. atriceps* he writes, "the whole of the rest of the upper parts are a clear Peregrine slaty blue," and, again, "beneath it is never so rufous as *F. peregrinator* usually (but not invariably) is*.

My specimens of these two Falcons (viz. *F. peregrinator* and *F. atriceps*) correspond in these points as much as it is possible for one bird to be like another. In fact my *F. atriceps* (if it is entitled to distinction) has a dark slaty-black head, *dark* grey back, and is *very* rufous beneath, being also *well marked*. If I remember right, Mr. Hume is not now inclined to regard his new bird as a good species, but is of opinion that all the Peregrinators of the North-west Provinces belong to the *atriceps* type, which he considers to be distinct from the specimen described by Sundevall from Southern India.

I take this opportunity of correcting an error that Dr. Jerdon has been led into, in supposing that "*many*" † specimens of this Falcon have been recently procured both by Mr. Hume and Mr. Brooks. My sole object in doing so is, that if such a statement is allowed to remain unchallenged, it strengthens the position of the new species. So far, therefore, from "*many*" specimens having been procured, Mr. Hume has or had a short time ago only two, and Mr. Brooks has also two—the one shot by me, and one got himself, a half-and-half bird which has already been alluded to.

11. Falco jugger, Gray. (The Jugger.)

Abundant, and very partial to open country. I have seen five and six in a morning's ride through large plains studded here and there with solitary peepul trees, and have preserved a fine series showing every gradation of colour, from the bird of the year, with leaden-white legs, feet, cere, and uniform brown plumage beneath, to the fully adult specimens, having the underparts pure white, and legs &c. of a bright yellow.

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* Rough Notes, part i. p. 58.

† Ibis, vol. i. (3rd ser.) p. 237.

The Jugger breeds in high trees, in the absence of cliffs, during January and February, laying usually four eggs. In size they are intermediate between those of *F. peregrinus* and *F. islandicus*, and not unlike Hewitson's plate of that bird's egg. I have never seen this Falcon build *its own nest on trees*, but have invariably found it take possession of the old nests of *Gyps bengalensis* or of *Milvus govinda*. Generally speaking, it is not even relined; but it is worth mentioning that one nest examined in my presence, in which the eggs were tolerably well incubated, was comfortably and warmly lined with several handfuls of small feathers. Did the birds instinctively make their habitation comfortable for the reception of their expected progeny, or were the feathers collected accidentally? I am inclined to think the latter was the case, as in *all* the nests examined by me this season the female bird has betrayed her whereabouts by making a plaintive cry, as Falcons do when hungry, and I am under the impression that the male caters for her during the season of incubation, and hence this accumulation of feathers in the nest. I shot a pair off the nest, the female of which was in the brown or juvenile plumage, probably a second year's bird, while the male was an old one. The Jugger is indeed a dirty bird, and swarms with huge disgusting parasites nearly half an inch long, which I have never noticed on any other Falcon.

16. LITHOFALCO CHIQUERA, Daud. (The Toorumtee or Red-headed Merlin.)

Is universally distributed. Breeds generally in February and March. The few nests discovered by me I attribute solely to the fuss made by these little Falcons, as they are most pugnacious and noisy during the breeding-season, actually attacking Kites and Crows at a considerable distance from the tree they have monopolized. On two occasions my tent happened to be pitched in a mango-tope where a pair of Toorumtees were busy building; and I found them a perfect nuisance, as they were incessantly darting out and driving away all manner of imaginable enemies. The nest is generally placed in a leafy clump, near the top of a tree (by preference the mango), and it is by no means easy of detection. Four is the usual complement of eggs they lay; and in size and appearance some in my collection would easily do duty for those of *Falco subbuteo* as figured by Hewitson. On the whole there appears to be the same relation between the eggs of this bird and of the Jugger Falcon as there is between those of the Peregrine and the Kestrel.

Mr. Hume states that he has "as yet obtained no egg earlier than the 15th of February"*. It is, indeed, strange that the only three nests taken by me were *all* before that date—one of them actually as early as the 9th of *January* last. One of these three *deserves* special notice. I was returning home late on the evening of the 4th of February last, when my attention was attracted by the familiar cry of one of these birds, which I found was attacking a common Kite in the most furious manner, at a considerable height in the air.

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* Rough Notes, part i. p. 91.

The only tree for a mile round was a gigantic solitary mango; and no sooner had I sent my man up the tree than the little Falcon flew straight to her nest, quite prepared to hold her ground. The nest contained two fresh eggs; but one of them had a largish hole on one side, exactly like what would be made by the beak of a bird; and through this aperture I blew the specimen. I imagine the Toorumtee had done this from anger when it saw that the nest was about to be robbed.

During the breeding-season I have several times observed the male and female feeding together in the most affectionate manner.

I think they must hunt in pairs in a wild state; and hence probably the native idea of training them to take the so-called Jay (*Coracias indica*) in that manner.

17. TINNUNCULUS ALAUDARIUS, Briss. (The Kestrel.)

The most common migratory Falcon in the country, arriving in October, and leaving again by the middle of April. It does not breed in the plains.

23. MICRONISUS BADIUS, Gmel. (The Shikra.)

Common, and builds during April and May. Dr. Jerdon could never have seen the eggs of this Hawk, or he would not have described them as "much blotched with reddish brown"*. I, for one, have never seen eggs of this bird with any markings at all; and in this respect the Shikra has its affinities with the Goshawk, and not with the true Sparrow-Hawks.

The Shikra is a great favourite with native falconers; and few of them can afford to keep more expensive Hawks. It is generally trained to take the different kinds of Minas (*Sturnus contra*, *Acridotheres tristis*, *A. ginginianus*, and *Temenuchus pagodarum*); I have lately seen a young bird, certainly under six months old, catch as many as six in a morning; and it has also been trained to take the small Crow (*Corvus splendens*).

24. ACCIPITER NISUS, Linn. (The Sparrow-Hawk.)

I found this a rare bird, which is clearly shown by my getting only one specimen, a young male. On three or four occasions I saw what appeared to be Sparrow-Hawks; but I cannot speak with any certainty as to their identity, as they were fearfully wild, not allowing me within a hundred yards or so.

27. AQUILA IMPERIALIS, Bechst. (The Imperial Eagle.)

Visits the plains in great numbers during the cold-weather months, leaving again early in April for its breeding-haunts. I have met with this fine bird in all localities; but it is very partial to large plains early in the season, where it may be seen seated on a low bough of the babool tree. As the season advances, it affects jheels and swamps, preying on Ducks &c. It is no exaggeration to say that I have seen a dozen of them in a large plain in the course of a morning.

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* Birds of India, vol. i. p. 50.

At first I found it impossible to get within shot of these Eagles, though I used a double-barrel No. 7 Duck-gun, carrying 7 drs. of powder and 2 oz. of shot. Latterly, however, I devised means by which a bird was hardly lost, and not only saved myself a considerable amount of ammunition, but also bodily suffering. Happening to be out one morning without my gun, I rode up to an Imperial which was perched on the top of a babool, some 25 feet high, in order to see how close the bird would allow me to approach. Having got to about 20 yards from the tree, and the bird showing no signs of uneasiness, I *stalked* her in a circuitous way (the same as one does when shooting Antelope), narrowing the circle each round I took, till at last I pulled up right under the tree, and looked the Eagle full in the face. She (sex judged from her size) was in the *lineated* stage, and kept her eyes fixed on me, apparently quite fascinated, and refused actually to fly notwithstanding I waved my hat at her. After this successful manœuvre I gave up shooting Raptores on foot, and invariably rode up to them in the manner above described, making my shikaree carry a small gun on my off-side, and giving him the order to fire when I got sufficiently close.

The food of the Imperial Eagle is as disgusting as it is varied according to circumstances; but I do not think the epithets "a great hulking Kite" and "ignoble feeder"* are justly applicable, at least not as far as my experience goes. It is true that the bird will consort with Vultures over a dead Bullock, making a hearty meal thereof, and that I have on several occasions found Frogs in their crops; but all Eagles will feed on carrion when pressed by hunger. I have found *F. imperialis* at times a bold and fearless bird, as the following anecdotes will show:—When encamped *in* the station of Eta, on the 7th of March last, I threw out the body of an Imperial which had just been skinned, and in a few moments I shot a brother Imperial in the act of tearing it to pieces, from my *tent door*. On another occasion a Wokab (*Aquila fulvescens*) had just deprived a Kite of the entrails of a Fowl, which again was immediately afterwards taken possession of by an Imperial, which in return fell to a charge of my gun in the most *public part of my camp*.

These instances are enough to show that my friend Dr. Tristram has rightly depicted the character of this Eagle when he calls it a "truly imperial bird," and, again, that "there is a beauty and majesty in its movements, and in its greater fearlessness of man when in search of food, which at once attracts one"†. Though hunger will compel this bird to eat carrion, there is no doubt that it prefers better food. I have seen them times without number perched on the boughs of trees overlooking swamps, evidently on the look-out for Ducks.

Early one morning, when out shooting (the sun had hardly risen), I heard the melancholy notes of the Brahminee Duck (*Casarca rutila*) overhead (a sound that must be familiar to every Indian sportsman), and five minutes later I saw a huge Imperial in the act of devouring the object of its affections, in the middle of a large Antelope plain. On another occasion I shot a magnificent female *black* Imperial, the only fully mature bird of the season, when about to take a Duck from the edge of a jheel. As it is now being contended that the European and Indian Imperial Eagles are two distinct birds, and as one rarely gets a black one in this country, I make the following verbatim extract from my notebook, which was jotted down on the spot:—

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* Rough Notes, part i. p. 145.

† Ibis, 1865, p. 251.

"Camp Mynpoory Canal, Feb. 11, 1871.—After examining the Jugger's nest I went along the banks of the winding jheel near the canal, as the ground looked promising for Peregrines and *A. nævioides*. To my delight I saw a black, rufous-headed Imperial fly across the jheel and settle on a small beyr tree; as she perched the bough regularly gave with her weight, and she had some difficulty in keeping her position on the sapling, first spreading out one wing and then the other to keep her balance true.

"As she was intent on watching the Ducks, I crossed the most shallow part of the jheel, and managed to crawl unobserved behind a cane-field to within 30 yards of the tree, when down she came without injuring a feather.

"*Measurements.* Length 33 in., wing 25 in.; tarsi to beginning of toes 4½ in., thence to root of mid claw 2½ in.; greatest width of foot 7 in., greatest breadth 5½ in.; hind claw along curve 2 in.; height of both mandibles at cere 1½, from base of cere to tip of upper mandible along the curve 3 in.; gape at point of both mandibles 3 in.

"*Sex.* Female, on dissection.

"*Weight.* 7 lbs. 6 oz.

"*Colour of soft parts.* Feet dingy yellow, gape and cere pale lemon-yellow; whole of mandibles, excepting the tips, which are black, pale blue; iris brown; claws black.

"*Plumage.* Head and neck pale rufous. Whole of upper plumage chocolate-brown; beneath much darker, nearly black. No *satisfactory traces* of white feathers on the scapulary region; quite absent on one side. The white feathers will perhaps appear when the bird gets older."

It is not my intention to enter into any discussion at present as to whether the Indian Imperial is distinct from the European bird. I believe that such, however, is now pretty generally admitted to be the case, by some of our leading ornithologists. The plumage question of the Indian bird is one of the greatest interest, and can only be worked out by ornithologists at home, who enjoy the privilege of examining specimens from all three continents. I am, however, fully convinced that in the four-fold stage of the Indian bird we have at least two distinct species. Can it be that the true *A. imperialis*, Cuv., visits India, and that *A. bifasciata* will yet stand to be a good species*? I hear from Dr. Tristram that the Indian bird is not supposed to have a white scapulary patch, and that the European one, on the other hand, has no *lineated* stage. Now it will be seen that the only black Imperial got by me had hardly any traces of white feathers, and that they were entirely wanting on one side. This would correspond with what Dr. Tristram has written; but unfortunately I have at present two more black birds (given to me) which have the white shoulders conspicuous enough, though by no means so large as shown in Bree's plate. I have just examined these three birds with the plate in question, with the following results:—

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* I shall endeavour to supply the Society with living examples of this bird for their Gardens, where alone the transitional stages can be satisfactorially observed, and the matter finally cleared up. It is impossible to do this by simply shooting the birds, as they leave the plains of India before they moult.

1. The tail in the European bird has a broad terminal band, and two distinct bars between that and the base of the tail. All three Indian examples have the same terminal band; but instead of the two distinct bars there are several (five or six) wavy marks, somewhat indistinct and irregular.

2. The Indian specimens want the light colour *down the centre of the back*, though the head agrees well enough. They also want the light ochreous shade between the shoulder and side of neck.

3. The Indian birds are, on the whole, very much blacker, and the white on the scapulary region is not so conspicuous; in one specimen it is as good as wanting.

With regard to the lineated stage, it is by far the most common bird in this country. Next in order comes the double-banded one, *A. bifasciata*, then the plain brown stage with light head, and lastly the fully adult black bird. Of the latter I bagged the only one seen, and of the three first I saw fully a hundred birds. It was my intention to send home a bird in each stage, as also the black one without white shoulders, to the Secretary, for exhibition at this Meeting; but, unfortunately, the present postal arrangements prevent my doing so.

There is another point regarding which I would wish to say a few words before concluding my remarks on this very interesting subject. It would appear that the Imperial and Tawny Eagle (*A. nævioides*, Cuv.), as also the Spotted Eagle (*A. nævia*), have been much confused by European writers—to wit, the admission of *A. nævioides* into Bree's work, when it had no right to a place, at that time, in the European list*.

Again, Captain Elwes, in his interesting paper "on the Birds of Turkey," states that a "series of Imperial, Tawny, and Spotted Eagles could be produced running imperceptibly into each other in size, and nearly similar in colour." I could make further quotations to show that the *structural difference* between the two *races* of Eagles, viz. the Imperial in all four stages (and with this I would unite the *Indian* Tawny Eagle, *A. fulvescens*), on the one hand, and *A. nævia* and *nævioides*, on the other hand, have not been noticed, *certainly not pointed out*. Leaving alone the question of plumage for the present, I would observe that the shape of the *nostril alone* is amply sufficient to separate the two races of Eagles. It will be seen that in the former two birds the nostrils are *elongated* and *vertical*, wider at the base than at the top, whereas in the two latter they are a *very broad ellipse*, nearly circular. I am indebted to Mr. Brooks for having pointed this out to me; and if this is once observed there is no possibility of an Imperial Eagle, no matter of what size or colour, being confounded with either the Spotted or Tawny Eagles, or of *A. fulvescens* being mistaken for either of the latter. The Wokab (*A. fulvescens*) may be associated with the Imperial, as far as the nostril is concerned; but the size and coloration of the bird are more than sufficient to distinguish it at a glance. I can now separate the two races of birds by merely seeing the nostrils and tails. The former point may not be sufficiently clear in some dried skins, especially if a thread has been drawn through the nose, which tends to destroy its natural shape; but in some thirty birds that I have just examined there is no mistaking the matter.

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* Lord Lilford on the Ornithology of Spain, 'Ibis,' 1865, p. 173.

28. AQUILA NÆVIA. (The Spotted Eagle.)

Is universally distributed in suitable localities. Arrives and departs much about the same time as the preceding species, and has not as yet been known to breed within the limits to which these notes refer. The Spotted Eagle is essentially a marsh-loving bird; and I have never met with it anywhere but in watery places. To see *A. nævia* in the zenith of his glory one has only to spend a week along the banks of the Cawnpore and Etawah canals, where adjacent marshes occur; and I have actually shot them from my dog-cart. Judging from the number of dissections I have made, Frogs would seem to constitute its chief food; and hence its fondness for marshy places. Its "bill of fare," however, is as varied as that of its congener *A. imperialis*; and it is also equally cannibalistic.

I threw away a badly shot specimen one morning as not worth skinning, when it was pounced upon almost immediately by one of its own species. On another occasion I shot one off the body of an Owl (*Urrua coromanda*) which had been thrown away the day before unskinned. But though I have enjoyed rare opportunities of studying the habits of the Spotted Eagle, I have never yet seen one attempt to take a live bird. Indeed it would appear that the feathered race were instinctively aware that they enjoyed perfect immunity from this Raptor, as I was once surprised to find an *A. nævia* and a pair of Episcopus Storks actually feeding *close together*, the former grubbing for land-crabs (which, by the way, they are very fond of), and the latter for earthworms.

With regard to plumage, this Eagle has only two well-marked stages, viz. the spotted and the uniform dark brown, nearly approaching a black. Judging from the comparatively few specimens one gets in the latter garb, at least in India, there is reason to conclude that the bird takes a long time (probably several years) before it assumes the fully mature livery. My chief aim was to obtain specimens without speck or spot, and I am sorry to think of the life that was sacrificed in furtherance of this object. After all, I do not think I procured three examples which could be called *perfectly spotless*. All these birds had white tarsal plumes, which I am inclined to consider is indicative of age.

Mr. Hume alludes to a "*buffy stage*"[*], described from a bird in that plumage, which was shot by Mr. Brooks; but this has since been referred to the first stage of *A. nævioides.*

That the latter gentleman was fully convinced that in this light-coloured bird he had a *rara avis* will be seen from the concluding remarks made by Mr. Hume when describing the Spotted Eagle[†], as also from Mr. Brooks's letter to 'The Ibis,' where he says, "I am now sure that this pure buff-and-grey plumage is a perfect one, that of an adult bird, and that this Eagle is quite distinct from *A. nævia,*" &c.[‡]

Mr. Brooks's supposition, however, as to *maturity* was a mistake, as a moulting specimen since obtained distinctly proves.

28 *bis*. Aquila nævioides, Cuv. (The Tawny Eagle.)

It is with no little pride that I am able to add two specimens of this rare and interesting Eagle to the few that have already been procured in this country.

We are indebted to the gentleman whose name has already appeared pretty frequently in these notes for having added this very fine bird to the Indian list. A brief history regarding the few examples as yet obtained in this country may not be out of place. The first specimen, a very pale buff bird, was shot by Mr. Brooks in the cold season of 1866-67; and this is the type of Mr. Hume's first stage of *A. nævia*. Subsequently Mr. Brooks procured seven, of which a moulting bird was shot in Pillibeet by Mr. Yeatman, making in all eight specimens. Two of these were exhibited by Dr. Tristram at this Society's Meeting in Jan. 1870[§], two are now in Mr. Hume's museum, and the remaining four are in Mr. Brooks's collection.

On my arrival in India, my earnest attention was given to this matter; and my labours have so far been crowned with success. To the above number I can add two birds, male and female, in a yellow-ochreous stage. My first introduction to *A. nævioides* is solely attributable to an accident: would that such mishaps were of more frequent occurrence! I had missed my camp one morning, and was driving along the canal, when a *yellow*-looking Eagle rose from a dry grass bed and settled a little ahead of me, in the dense fringe of jungle trees which grow so luxuriantly along the canal-banks.

My second bird (the female), strange to say, was got very much in the same way. After my first success I stuck to the canal, riding and driving frequently twenty miles a day along the banks, and getting every thing that could be expected, save and except *A. nævioides.* I was just about to leave that part of the country in utter despair, when my patience was again rewarded. On this occasion I actually drove under the babool tree where the bird was sitting. It was latish in the evening, and the rays of the setting sun made the Eagle have a golden-yellow appearance. From the little I have seen of this bird, and judging from the fact that all of those that have been procured were shot in the vicinity of jheels, there is every reason to conclude that, like its congener *A. nævia*, it is also a marsh-loving bird. I believe it to be, however, a more game-killing Raptor; and though the crop of one of my specimens contained only a frog, Mr. Brooks once saw *A. nævioides* strike a pond-Heron, *Ardea leucoptera*.

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[*] Rough Notes, pt. i. p. 164.

[†] Rough Notes, pt. i. p. 172.

[‡] Ibis for 1870, p. 290.

[§] P. Z. S. 1870, p. 4.

With regard to its plumage, it would appear to have several stages, viz. pale buff, yellow, tawny red, and dark chocolate-brown, with a pale fulvous head; but perhaps these shades are only a matter of complexion. Most of the birds got in this country have been in the first two stages; and only one fully adult specimen has as yet been procured, and this one is now with Dr. Tristram. I trust Dr. Jerdon will pardon me for pointing out that this Eagle is by no means so common as is to be inferred from his "Supplementary Notes" *.

The following is a complete record of every specimen that has as yet been known to have been obtained in this country:—

1, ♂. A pale buff bird, Etawah, Feb. 20th, 1867, given to Dr. Tristram.

2, ♀. A pale buff bird, Etawah, March 1868, given to Mr. Hume.

3, ♀. A dark red bird, March 1869, given to Dr. Tristram.

4, ♀. A buff bird, Nov. 1869, with Mr. Brooks.

5, ♀. A buff bird, Dec. 1869, given to Mr. Hume. This bird has bars on the tail square across the feathers, not diagonal as in *A. fulvescens*.

6, ♀. A buff bird, Jan. 1870, with Mr. Brooks.

7, ♀. A dark brown and partly buff bird (moulting), new feathers dark red-brown on lower parts, shot in Pillibeet, in Jan. 1870, by Mr. Yeatman, with Mr. Brooks.

8, ♀. A buff bird, Jan. 29th, 1870, with Mr. Brooks.

9, ♂. A yellow bird, shot by me, Feb. 8th, 1871.

10, ♀. A yellow bird, shot by me, March 12th, 1871.

Aquila nævioides has contributed not a little towards the general confusion of the Eagle question. That the *European* Tawny Eagle and the *Indian* Tawny one (*A. fulvescens*) have been considered one and the same bird must have been apparent to any attentive reader of Bree's work†. Mr. Blyth, while pointing out that the Wokab was a "considerably smaller bird"‡ than its congener, failed to show the *structural difference* between the two birds, which he most certainly would have noticed had he handled both together. Dr. Tristram holds (*in epist.*) "that in some stages *A. fulvescens* and *A. nævioides* seem awfully close." "I am not sure," he adds, "that *A. fulvescens* is any thing more than a small race." In the face of the above it would appear almost presumptuous in me to point out that the two *birds are wholly distinct and separate*; and I trust that ornithologists who may now have any doubts on the subject will compare the nostrils and tails of the two birds. It will be found that these two Eagles differ in the following points:—

1. *A. fulvescens* has its nostrils elongated and vertical, while *A. nævioides* has them broad and elliptical, almost circular.

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* Ibis, April 1871, p. 245.

† Bree, vol. i. pp. 72, 73.

‡ Ibis, vol. ii. new series, p. 241.

2. The former has the tail invariably barred, the latter *rarely* (judging from Indian examples). Only one out of ten specimens has any indication of bars: these do not extend across the feathers, but only occupy a space close to the shafts of the feathers; and they are not diagonal as in *A. fulvescens*, but at right angles to the shaft.

3. There is a most decided difference in the *feel* of the plumage of the two birds; that of *A. nævioides* is soft and silky, while that of the other bird is stiff and harsh.

I will now leave the matter in the hands of those who will examine the birds in question to judge for themselves whether there is any possibility of confusing the two Eagles together. As far as mere coloration of plumage is concerned, there are probably no two Eagles which resemble each other more than *A. nævioides* and *A. fulvescens* do in *some stages* of plumage; and I am not ashamed to admit that I have in my collection a large very pale Wokab (nearly cream-coloured), which I carefully ticketed *A. nævioides*. On showing this bird to Mr. Brooks my hopes were dashed to the ground; and I can now conscientiously state that I could separate these two birds, no matter in what stage, by simply looking at their nostrils and tails.

On the same day that I got my female *A. nævioides* I also shot a fine adult *A. nævia*; and as it is not every one who has the treat of comparing these two birds together in the flesh, the following careful measurements &c. are annexed in a tabular form for the sake of easy reference and comparison:—

	♀ *Aquila nævioides.*	♀ *Aquila nævia.*
	inches.	inches.
Length	28	28
Wing	22·5	21·5
Tarsi to joint of toes	4·6	4·3
Foot, greatest length	5·9	5·5
Foot, greatest breadth	5·4	5·0
Mid toe to root of claw	2·5	2·3
Its claw along curve	1·3	1·3
Hind toe to root of claw	1·2	1·3
Its claw along curve	1·7	1·4
Bill, straight, including cere from forehead to point of beak	2·1	1·9
Bill along curve	2·6	2·2
„ from gape	2·5	2·3
„ width at gape	1·6	1·6

Remarks.

A. nævioides.—Weight 5 lb. 3 oz. Crop contained a yellow frog. Cere pale yellow; gape dark yellow; basal half of both mandibles pale slaty blue, tips horny black. Eye-shelf pale greenish yellow; eyelids leaden; orbital space covered with white down; iris dark hazel-brown; a black eye-streak or eyebrow from cere to end of eye.

A. nævia.—Weight 4 lb. 4¾ oz. Crop contained *nil.* Feet dingy yellow; cere and gape pale lemon-yellow; iris light brown. This was a spotless bird with white tarsal plumes.

It will be observed that though the two birds are nearly the same in linear dimensions, *A. nævioides* is a heavier and more robust bird; its beak is larger and more massive, and its tarsi, toes, and claws are longer.

3. Descriptions of two new Species of British Holothuroidea. By GEORGE STEWARDSON BRADY, C.M.Z.S., and DAVID ROBERTSON, F.G.S.

[Received October 27, 1871.]

(Plates LXXI. & LXXII.)

SYNAPTA TENERA, Norman. (Plate LXXI. figs. 1–4.)

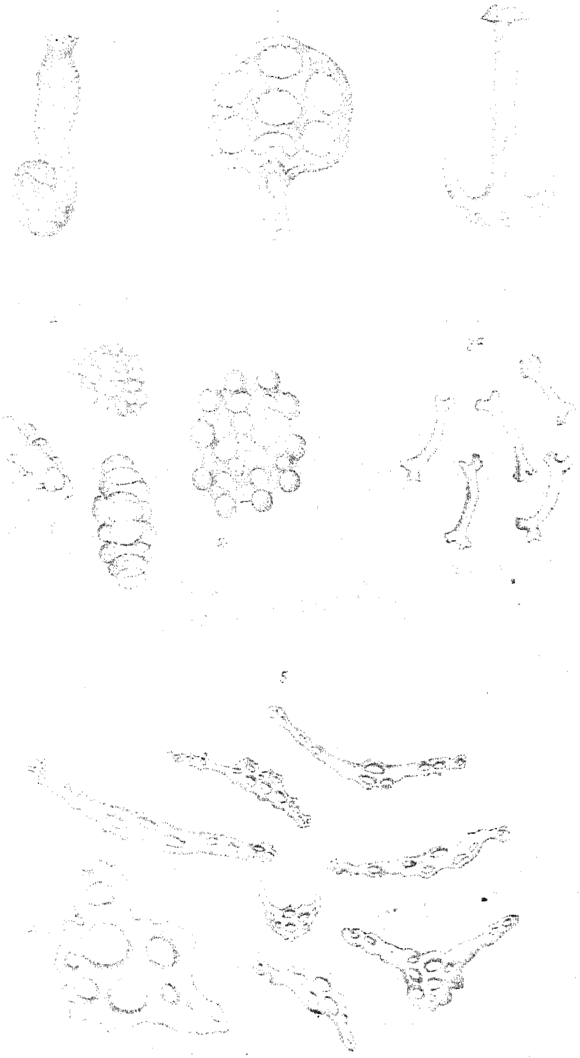
Body about eight times as long as broad, tapering slightly towards the posterior extremity: tentacles short and sparingly pinnate. Anchor-plates few in number, subpentagonal, with a broad handle or pedicle, the length of which is equal to about one half the width of the plate: one broadly ovate, crenulated, central perforation, surrounded by five of similar size and shape and another crescentiform, the last named being situate just above the base of the pedicle. The pedicle itself has near its base a wedge-shaped aperture, and at the free extremity two or three irregular sublinear perforations. The anchors themselves are slightly longer than the anchor-plates, and are often minutely and irregularly perforated in the shaft and arms. At the bases of the tentacles are a few minute spicules, curvilinear in form, with divaricated furcate extremities (fig. 4). The whole animal is very tender and delicate in structure, and almost perfectly transparent, five opaque white longitudinal lines, however, being very conspicuous. Length an inch to an inch and a half.

The only locality in which we have met with this species is the Frith of Clyde, where it occurs not unfrequently in black ooze, in a depth of 15–30 fathoms.

Synapta tenera was named and briefly referred to by the Rev. A. M. Norman at a meeting of the British Association some few years ago, his remarks being based upon specimens taken by Mr. Robertson in the above-mentioned locality.

CUCUMARIA SAXICOLA, nov. sp. (Plate LXXII.)

Body of nearly equal thickness throughout, scarcely at all tapering at the extremities; skin excessively thick and strong. The spicules of the body are usually subrhomboidal in shape (fig. 3 *a*), but in process of growth tend to lengthen out at the extremities (fig. 3 *b*); each plate has in the centre four oval perforations arranged diamondwise, the two in the short axis being the largest; but as the plate increases in size more perforations become developed in the direction of the long axis (*b*). These plates are by no means very thickly set, and are interspersed with numerous much smaller spicules of a stel-

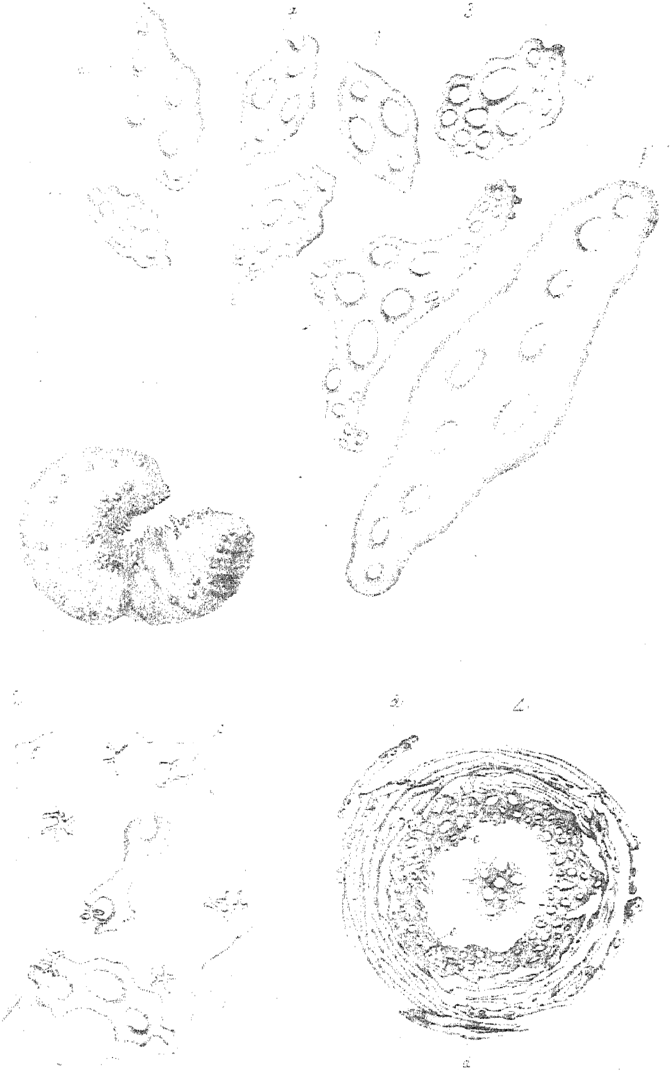


G. S. Brady del.

M & N. Hanhart imp.

SYNAPTA TENERA.
CUCUMARIA PENTACTES.

P.Z.S. 1871. PL. LXXII.



G S Brady del.

M&N Hanhart imp.

CUCUMARIA SAXICOLA.

late form (fig. 2*c*). The sides of the suckers contain numerous elongated curvilinear and irregularly perforated spicules (fig. 4*d*), within which, but perhaps only at the extremity of the sucker, are a number of irregularly angular plates (figs. 4*e* and 3*f*); the extremity of the foot is furnished with a single central circular cribriform plate. Length from 1 to 3 inches. Colour white.

Habitat. In the holes and crevices of limestone boulders between tide-marks, Westport Bay, co. Mayo, Ireland. A single specimen dredged in Birterbuy Bay, co. Galway.

Cucumaria saxicola somewhat approaches in general appearance to *C. lactea*, but is altogether larger and more robust, and the spicules of the skin are formed on quite a different plan. In its littoral habitat, too, *C. saxicola* differs, so far as we know, from all other British species of sea-cucumbers. We obtained several specimens (about half a dozen in all) amongst the shore boulders in Westport Bay; and in all cases they were very firmly attached to the rocks, following the contortions of a fissure or "worm-hole," and adhering with such tenacity as sometimes to require the aid of a knife to remove them*.

CUCUMARIA PENTACTES, Müller. (Plate LXXI. figs. 5, 6.)

This species being nearly allied to the preceding, we have thought it desirable to figure the spicules, which distinguish it at once, if such a test were needed, from *C. saxicola.*

C. pentactes is in colour dark brown or purple, is widest in the middle, and tapers much towards the hinder extremity; it lives constantly unattached, amongst soft mud. Its skin, though to the eye and touch very much more delicate than that of *C. saxicola*, is seen under the microscope to be composed almost entirely of a mass of calcareous spicules, one layer superimposed on another, so as absolutely to leave no other tissue discernible. These spicules have a rounded outline, are perforated with round apertures, and round the margins, as well as in the interspaces of the perforations, are studded with large bead-like tubercles. The body-spicules are figured in Plate LXXI. fig. 5, those of the feet in fig. 6.

Our only specimens of *C. pentactes* were dredged by Mr. Robertson in the Frith of Clyde, where it is not uncommon.

EXPLANATION OF PLATES.

PLATE LXXI.

Fig. 1. *Synapta tenera*, about twice the natural size.
  2, 3. Plate and anchor of the same. × 300.
  4. Spicules from neck of the same.
  5. Spicules from skin of *Cucumaria pentactes*. × 210.
    a, seen from front; *b*, obliquely; *c*, *c*, laterally.
  6. Foot-spicules of *C. pentactes*. × 105.
    a. The same. × 210.

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* The specimen from which fig. 2 (Plate LXXII.) is taken was dredged in 15 fathoms in Birterbuy Bay; its spicules are smaller and much less closely set than in those from between tide-marks in Westport Bay.

PLATE LXXII.

Fig. 1. *Cucumaria saxicola*, about twice the natural size.
(Taken from a specimen contracted by preservation in spirit.)
2. Portion of skin of the same with spicules *in situ*. × 210.
3. Spicules from body of the same. × 210.
4. Transverse view of foot of the same. × 84.

4. Description of a new Species of Dove from the Coral-reef of Aldabra. By P. L. SCLATER, M.A., Ph.D. F.R.S., Secretary to the Society.

[Received October 27, 1871.]

(Plate LXXIII.)

In my report on the additions to the Society's Menagerie for June last* I recorded the arrival of a pair of Doves, presented to the collection by Mr. Edward Newton, and brought home for us by Sir Henry Barkly on his return to this country from Mauritius. Mr. Newton informed me that these Doves were procured for him by Mr. Swinburne Ward, when he visited the coral-reef of Aldabra in 1868, and were believed to belong to an undescribed species. Aldabra Island lies in the Indian Ocean, north of Madagascar, in about 9° 26′ S. lat. and long. 46° 35′ E. Upon announcing the arrival of these birds I proposed for them the temporary designation *Turtur aldabranus*, under which name I now propose to describe this interesting species, as follows:—

TURTUR ALDABRANUS, sp. nov. (Plate LXXIII.)

Supra brunneus unicolor, capite toto cum collo undique vinaceo perfusis: colli postici plumis nigris vinaceo terminatis, tanquam squamatis: subtus cineraceus, usque ad medium pectus vinaceo perfusus, ventro medio crissoque albis: alarum remigibus cineraceo-brunneis, unicoloribus: caudæ rectricibus duabus mediis omnino et proximis in pogonio exteriore brunneis dorso concoloribus: ceteris omnibus nigris, limbo unciali lactescenti-albo terminatis: subalaribus cineraceis: rostro plumbeo, apice flavicante, pedibus carneis: long. tota 10·5, *alæ* 5·75, *caudæ* 3·9, *tarsi* 1·1 *poll. Angl. et dec.*

Hab. Insula Aldabra.

Obs. Proximus *Turturi rostrato* ex ins. Seychellensibus, a quo uropygio et rectricibus mediis brunneis, nec cineraceis, et rostro debiliore diversus: differt a *Turture picturato* capite vinaceo nec cinereo.

The pair of this Dove which Mr. Newton sent us were in good health; but the hen had an injured wing, which prevented her from flying off the ground. Notwithstanding this, when placed in the large Western Aviary they quickly showed symptoms of breeding, and about three weeks after their arrival built a nest in the interior of the compartment assigned to them. A few days after this, as our head keeper, Mr. B. Misselbrook, informs me, two eggs were laid, and incubation was commenced, the male taking turns with the female on the nest. In sixteen days one young one was hatched, on the 17th or 18th of July, and is still living in the aviary. The other egg turned out to be addled; and I now exhibit its shell, which, like that of all Pigeons, is of a spotless white. It measures 1·35 inch by ·95 inch. About the end of September the hen sickened and died. I now exhibit her skin, from which the accompanying figure (Plate LXXIII.) has been prepared.

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* See *anteà*, p. 623.

Mr. Newton tells me that this Dove has also bred in the Mauritius.

The Aldabran Dove is, as above pointed out, closely related to *Turtur picturatus* of Madagascar and *T. rostratus* of the Seychelles, the three species forming together a small section of the typical *Turtures*. *Turtur picturatus* is now found in Mauritius, but is believed by Prof. Newton to have been originally introduced there from Madagascar. It has certainly been introduced into the Seychelles, whence I now exhibit a skin not differing from Mauritian examples.

I am greatly indebted to Prof. Newton for placing at my disposal his series of skins of these birds, which is now before the Society.

5. Description of a new Himalayan Finch, *Procarduelis rubescens*. By William T. Blanford, C.M.Z.S.

[Received November 6, 1871.]

(Plate LXXIV.)

Amongst a collection of birds sent to me for determination some time since by Mr. Mandelli, of Darjeeling, was a female *Procarduelis*, which I found, on comparison, to be the same as *Linota fusca* of Blyth, whilst it differed much from both Hodgson's and Jerdon's description of the female of *Procarduelis nipalensis*. I wrote to Mr. Mandelli about this; and he has sent me five specimens altogether of *Procarduelis*, two males and three females, adding that it appeared to him that more than one species was represented. This is certainly the case; one male and two females agree both in colour and structure with the types of Mr. Blyth's *Linota saturata* and *L. fusca* in the Asiatic Society's collection; and there can, I think, be no question of the identity of the male with the same sex of Hodgson's *Procarduelis nipalensis*, described in the 'Asiatic Researches,' vol. xix. p. 157. The description, however, of the female of *P. nipalensis* given by Hodgson, and copied by Jerdon in the 'Birds of India' ("from the chin to the breast dirty yellowish, from breast to tail white"), does not agree with any of the birds before me. The remaining male and female sent by Mr. Mandelli appear to me to belong to an undescribed form.

I shall, before proceeding to describe the new species, give a fresh description of both sexes of *Procarduelis nipalensis*.

Male. Forehead and front of crown bright crimson; supercilia, running back to the sides of the nape, the same, but a little paler; lores, a stripe through the eye to the ear-coverts, crown of head behind, and sides of neck dusky red; back and smaller wing-coverts blackish brown, the feathers with blood-red margins, which are rather more conspicuous on the rump; quills, larger wing-coverts, and tail-feathers blackish brown, with narrow pale reddish edges inconspicuous on the rectrices, and broad only on the tips of the outer webs of the last three quills and on the coverts; sides of head below the eyes and throat rosy crimson; breast deep dark red, nearly the same colour as the top of the head; abdomen rosy pink; under tail-coverts brown with pink margins. *Tarsi faintly scutellated.*

Female. Above fuliginous umber-brown, the feathers rather darker near the shafts; greater and smaller wing-coverts and the last three wing-feathers with pale tips to the outer webs; quills and tail-feathers darker brown than the back and with very narrow pale edges. Lower parts uniform umber or earthy brown, with a slight olivaceous tinge, and paler in colour than the back.

Dimensions.

	Wing.	Tail.	Tarsus.	Bill from forehead.
Male	3·6	2·45	0·85	0·42
Female	3·4	2·3	0·85	0·45
Female	3·32	2·35	0·85	0·46

PROCARDUELIS RUBESCENS, sp. nov. (Plate LXXIV.)

P. nipalensi *affinis, sed minor, tarsis brevioribus et distinctius scutellatis: maris colore omnino dilutiore, capite insuper et dorso brunneis, illius plumis coccineo marginatis, hujus sanguineo lavatis, uropygio lætiore; rectricibus, remigibus et tectricibus alarum brunneis rufescenti-fulvo marginatis; genis gulaque pallide coccineis; pectore abdomineque griseis, coccineo-tinctis: long. alæ* 3·2, *caudæ* 2·25, *tarsi* 0·75, *rostri a fronte* 0·47 *poll. Angl.*

Fœmina (*vel* mas juvenis?) *supra olivaceo-brunnea, infra pallide umbrina; uropygio et marginibus externis rectricum, remigum, alarum tectricumque rubro tinctis: long. alæ* 3·2, *caudæ* 2·15, *tarsi* 0·72, *rostri a fronte* 0·47 *poll.*

Hab. in Sikkim, in montibus Himalayanis.

Male. The feathers of the head above brown, broadly margined with rosy scarlet, or a colour intermediate between scarlet and crimson; sides of head a little paler, the red margins of the feathers being narrower; back brown, the feathers tinted and edged with blood-red, more broadly so on the rump; wing-coverts, quills, and tail-feathers brown, margined with dull fulvous red; throat rosy with a scarlet tinge, passing gradually into the colour of the breast and abdomen, which are grey with a red wash; under tail-coverts pale brown with darker central stripes.

Female (or young male) olivaceous brown above, the feathers with paler margins, which have a brighter red tinge on the rump, wing-coverts, quills, and tail-feathers; lower parts pale umber.

The tarsi are shorter than in *P. nipalensis*, rather stouter and much more strongly scutellate, besides being apparently rather paler in colour; the claws are rather larger; and the bill appears to be stouter; but this last difference may be due to individual peculiarity.

The coloration of the new species is very different from that of *P. nipalensis*. The bird in summer plumage may owe its olivaceous tint to being a young male, and the female of *P. rubescens* may be as dully tinted as that of its congener; but the male is altogether paler and lighter in colour, and wants the deep rich crimson of the back and breast, the rosy throat, and pink abdomen of *P. nipalensis*, being rather a brown or greyish-brown bird, with the feathers margined with red.

It still remains to be ascertained what is Hodgson's female *P. nipalensis*. As I have remarked above, the dull-coloured bird sent to me may be a young male; but I scarcely think that the difference in the tarsi from those of *P. nipalensis* would have escaped so sharp an ornithological eye as Mr. Hodgson's, or that the bird described by him as the female of *P. nipalensis* can have belonged to the species now distinguished.

6. Note on *Ceriornis caboti*.

By Thomas Salvadori, M.D., C.M.Z.S.

[Received November 4, 1871.]

CERIORNIS CABOTI.

Ceriornis caboti, Gould, P. Z. S. 1851, p. 161; *ejusd.* Birds of Asia, pt. x. pl. 2; Sclat. P. Z. S. 1863, p. 123; Swinh. Ibis, 1865, p. 350; Sclat. P. Z. S. 1870, p. 164.

In the King of Italy's private collection at Florence is a *Ceriornis* which was brought from some Chinese port alive by an Italian trader in Silkworm-seed, and arrived alive in Genoa, but died before reaching its destination in His Majesty's aviary.

Prof. Giglioli some time ago sent me a drawing of it, which so much differed from Gould's plate, that at first I thought it represented a different species. But when I compared the specimen itself with the plate I was convinced that it was really a fully adult specimen of *C. caboti*, and I accounted for the differences by supposing that the specimen represented by Gould was not fully adult, or in an imperfect state of preservation.

The differences regard the head and the tail, while the body and wings are exactly the same. The tail in Gould's plate wants the large black band at the end, which is very conspicuous in the specimen before me.

More important are the differences in the head. In Gould's plate there are no horns on the sides of the head, the chin and throat are black, on the sides of the throat there are two wattles or naked spaces blue striped with red; the periophthalmic region is red and green; and, lastly, on the sides of the neck there is a red patch of feathers separated below from the buff colour of the breast by a black line.

In the specimen before me there are two horns well developed, one on each side of the head, of a bluish colour; the chin and throat are covered with naked skin, forming a prominent fold along the middle, of an orange-red colour for the greatest part, blue towards the sides, and flesh-colour on the edge, from which the flesh-colour protrudes with several patches on the blue; the periophthalmic region is orange-red; and on the sides of the neck the red feathers do not make a patch limited below by a black line, but mix with the spotted ground of the upper parts, and follow underneath the circle of black feathers which fringes the naked skin of the throat.

7. Descriptions of seven new Species of the Genus *Helix*, and of two Fluviatile Shells from Tasmania. By JOHN BRAZIER, C.M.Z.S.

[Received October 30, 1871.]

1. HELIX (PITYS) ARCHITECTONICA.

Shell rather widely umbilicated, depressedly orbicular, thin, glassy, shining, regularly and closely arcuately ribbed, the interstices very finely striated; spire rather elevated, suture impressed; whorls 5, convex, last large, convex, descending a little in front; base convex, sculptured the same as the upper surface; umbilicus wide, rather narrow at the bottom; aperture nearly vertical, roundly lunate; peristome simple, thin, acute, margins approximating.

Diam. maj. $1\frac{1}{2}$, min. $1\frac{1}{4}$, alt. $\frac{3}{4}$ line.

Hab. Near Hobart Town, Tasmania (*Petterd*).

This little species is allied to *Helix pexa*, Cox, from New South Wales.

2. HELIX (PITYS) PETTERDI.

Shell widely umbilicated, depressedly circular, thin, dull brown, very minutely striated throughout with lines of growth, giving it a silky appearance; spire moderately elevated, apex obtuse, suture very much impressed; whorls 5, rather convex, last not descending, convex, base convex; umbilicus nearly perspective, about one third of the diameter; aperture oblique, roundly lunate; peristome straight, simple, thin, acute, margins distant.

Diam. maj. 2 lines, min. $1\frac{3}{4}$, alt. 1 line.

Hab. Huon Road, near Hobart Town, Tasmania; found under chips (*Petterd*).

I have very often received this species under the name of *H. legrandi*, Cox; the species described by Cox is allied to *H. juloidea*, Forbes, which with *Helix onslowi* and *H. rotella*, Brazier, belong to the subgenus *Charopa*, whereas *H. petterdi* is quite distinct from any other known species from Tasmania.

3. Helix (Pitys) assimilis.

Shell widely umbilicated, subdiscoidal, thin, diaphanous, glassy, shining, regularly and obliquely finely ribbed throughout, interstices as seen under the lens finely striated, dirty brown; spire very little raised, apex obtuse, suture impressed; whorls 5 to 5½, moderately convex, last convex, descending a little in front, base convex; umbilicus wide and moderately deep, rounded at the bottom; aperture oblique, roundly lunate; peristome simple, straight, acute; margins rather distant, right very little expanded, columellar margin not reflected.

Diam. maj. 1½, min. 1¼, alt. ¾ line.

Hab. Near Hobart Town, Tasmania (*Petterd*).

This species differs from *H. petterdi* in being finely ribbed, and in having the interstices finely striated; the preceding species is finely striated throughout with lines of growth, the interstices being scarcely perceptible.

4. Helix (Pitys) subrugosa.

Shell rather widely umbilicated, somewhat depressedly orbicular, thin, shining, reddish-horny, subrugosely and obliquely striated, the interstices much more finely striated; spire very little elevated, apex obtuse, suture channelled; whorls 5½, moderately convex, last flattened above the periphery in form of a furrow, the groove being distinctly seen in front; umbilicus wide at the top, three fourths of the diameter, base convex, striated the same as the upper surface; aperture nearly diagonal, subtriangularly ovate; peristome simple; margins distant, right straight, sloping and expanded, basal slightly thickened and reflected.

Diam. maj. 1¾, min. 1½, alt. 1 line.

Hab. Near Hobart Town, Tasmania (*Petterd*).

This beautiful little species I received from Mr. W. Petterd; it may be distinguished very easily by the bold projection of the ribs, and by the interstices being of finer sculpture; the last whorl above the periphery is also depressed and has a furrowed appearance.

5. Helix (Videna) floodi.

Shell deeply and widely umbilicated, convexly depressed, thin, translucent, not shining, finely and irregularly striated with silky striæ, and, as seen under the lens, minutely spirally striated, light horny green, nearly white; spire rather small, very little elevated; whorls 5, moderately convex, last very large and inflated, roundly convex, not descending in front; base convex, striated the same as the upper surface; aperture diagonal, lunately rounded; peristome simple, thin, acute; margins approximating, right very little depressed, basal margin recurved and reflected.

Diam. maj. 4½, min. 4, alt. 3 lines.

Hab. Near Hobart Town, Tasmania.

This species I have named after my friend and fellow voyager Mr. William Flood, R.N., late of Her Majesty's Steam-ship 'Curaçoa.'

6. HELIX (VIDENA) MILLIGANI.

Shell umbilicated, discoidal, thin, closely and accurately ribbed; interstices striated with fine granular-like lines, not shining, pale horny green; spire depressed, suture very little impressed; whorls 4½, flatly convex, last large, inflated, convex, base striated the same as the upper surface; umbilicus deep and wide, sugarloaf-shaped, with the striæ running into it; aperture oblique, lunately ovate; peristome simple, thin, acute, straight; margins rather distant, right expanded, columellar margin recurved a little over the edge of the umbilicus.

Diam. maj. 5, min. 4¼, alt. 2½ lines.

Hab. Mount Wellington, Tasmania (*Petterd*).

Named in honour of Dr. Milligan, whose indefatigable exertions in the cause of science have made us acquainted with many new and rare Tasmanian shells.

7. HELIX (VIDENA) PASCOEI.

Shell umbilicated, discoidal, obliquely closely and very finely ribbed, spirally striated, the interstices as seen under the lens with fine silky striæ, not shining, dark reddish horny; spire quite flat, suture furrowed; whorls 4½, nearly flat, last large, roundly convex; base light brown, convex, sculptured the same as the upper surface; umbilicus deep and narrow, with the striæ running into it; aperture diagonal, ovately lunate; peristome simple, thin, acute, regular; margins rather approximating, right scarcely expanded, basal margin not reflected.

Diam. maj. 4, min. 3, alt. 1¾ lines.

Hab. Near Hobart Town, Tasmania (*Petterd*).

This species is quite flat, like a *Planorbis*, with the suture furrowed or deeply indented.

8. PALUDESTRINA LEGRANDIANA.

Shell elongately conical, thin, semipellucid, greenish horn-colour under a dark epidermis; whorls 6½, somewhat flattened, the last three keeled below the suture, and furnished with small, solid, stunted, hair-like spines (as seen under the lens) of a bright transparent horn-colour, flattened on the top; aperture ovate, margins continuous, thickened, outer lip reflected.

Length 2½ lines, breadth 1¼ line.

Hab. Salmon-ponds, New Norfolk, Tasmania (*Legrand*).

This species is allied to *Paludestrina salleana*, Fischer, from Auckland, New Zealand.

9. PALUDESTRINA WISEMANIANA.

Shell elongately conical, thin, semidiaphanous, epidermis light green; apex acute; whorls 6 to 6½, convex, smooth, grooved at the suture; aperture ovate; margins continuous, moderately thickened, columellar margin reflected, outer lip edged with green and reflected.

Length 2 lines, breadth 1 line.

Hab. Near Hobart Town, Tasmania; common in all the creeks (*Legrand* and *Petterd*).

I take this opportunity of correcting a few errors that I have made in a previous paper in these 'Proceedings.'

Helix (*Charopa*) *ammonitoides* to be altered to *Helix* (*Charopa*) *bassi*.—Proc. Zool. Soc. 1870, p. 661.

Helix (?*Charopa*) *dispar* to be altered to *Helix* (*Pitys*) *dispar*.—Proc. Zool. Soc. 1870, p. 661.

This species is the only one I know of in Tasmania with the small tooth in the interior of the aperture. We have *H. bisulcata*, said to come from the same locality, but none so small as the present species, which is somewhat like one that I have from Norfolk Island.

A second communication from Mr. John Brazier, contained some remarks on previously described species of Land-Shells, and stated that *Helix quintalæ* of Cox, P. Z. S. 1870, p. 82, should have been written *quintali*, having been named at Mr. Brazier's request in honour of Mr. Arthur Quintal, jun., of Norfolk Island; also that *Helix ardua*, Cox, P. Z. S. 1870, p. 82, had been collected by Mr. Brazier at Vanua Lava, Banks's Group, as well as at Erromanga. The name *Helix vannæ lavæ*, Cox, P. Z. S. 1870, p. 82 (lege *vanuæ lavæ*) was stated to be a misnomer, the species not occurring in the island of that name.

December 5, 1871.

John Gould, Esq., F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the months of October and November 1871:—

The total number of registered additions to the Society's Menagerie during the month of October 1871 was 95, of which 5 were by birth, 45 by presentation, 31 by purchase, 4 by exchange, and 10 were received on deposit. The total number of departures during the same period by death and removals was 106.

The most noticeable additions during the month of October were as follows:—

1. A third collection of animals from Chili, purchased (as on two

former occasions, from Mr. Weisshaupt) on October 4th. This consisted of the following animals:—

2 Andean Geese, *Bernicla melanoptera.*
2 Magellanic Geese, *Chloëphaga magellanica.*
1 Chiloe Wigeon, *Mareca chiloensis.*
2 Chilian Teal, *Querquedula creccoides.*
9 Pampas Cats, *Felis passerum**.
1 Spectacled Bear, *Ursus ornatus.*

Of these, the Chilian Teal and the Spectacled Bear (which has been deposited with the Society for safe custody since the 16th May, 1871) are new to the Society's collection.

2. A Cape Eared Seal (*Otaria pusilla*), presented by H.E. Sir Henry Barkly, C.M.Z.S., October 5th. Sir Henry Barkly, having obtained three living examples of this species at Cape Town, sent them home to the Society by the steamship 'Norseman,' under the kind care of Capt. Coxwell. Sir Henry, in a letter, dated Government House, Cape Town, September 17, states that the animals sent were all young females, from six to eight months old, the males captured on the same occasion having either died or escaped. Of the three examples transmitted, only one survived to reach the gardens, where it is doing very well, being fed principally upon sprats and other small fishes. This *Otaria*, in general form and shape, as will be seen by the sketch exhibited, is not very different from our female *Otaria jubata*. It is, however, of very much smaller dimensions, measuring only about 2 feet 6 inches in length. Perhaps the most noticeable external point of difference is the large size of the external ears, which measure about 1¼ inch in length. The front flippers appear also to be proportionally shorter than in *O. jubata*.

The total number of registered additions to the Society's Menagerie during November was 49, of which 1 was by birth, 34 by presentation, 9 by purchase, 3 by exchange, and 2 were received on deposit. The total number of departures during the same period by death and removals was 121.

The most noticeable additions were as follows:—

1. Maleo bird, *Megacephalon maleo*, presented by Capt. Parish, R.N., November 6th.

Capt. Parish informs me he obtained this rare Celebean bird in St. Helena out of a vessel coming from Java. Only upon one previous occasion, I believe, has the species been before exhibited in the Society's Gardens; and that was many years ago.

2. A male Chinese Pucras, *Pucrasia xanthospila*, presented by the Duke of Wellington, K.G., November 10th.

A few days subsequently, a female of the same species, which had been placed in the gardens on deposit, was purchased; so that the Society is now, for the first time, in possession of a pair of this fine Pheasant, which it is hoped will breed next season.

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* I propose thus to write the specific name instead of the Spanish "*pajeros*," which is neither "Latin" nor "like Latin."—P. L. S.

3. Two Grey Seals (*Halichœrus grypus*) purchased November 11th, through the kind agency of Mr. Samuel Williams of St. Davids, Pembrokeshire. Though the Grey Seal is said to be not uncommon on some parts of the British coast, we have never previously succeeded in obtaining living specimens of it.

From what Professor Flower informs me, I am now induced to believe that all the Seals of the genus *Phoca* (except the Greenland Seals, *Phoca grœnlandica*) hitherto received alive by the Society have been referable to the *Phoca vitulina*, the specimens to which we have applied the name of *Phoca fœtida*, as in the 'Catalogue of Vertebrates,' 4th edit. p. 27, having been simply large specimens of the former species.

4. A fine young male Sœmmerring's Antelope (*Gazella sœmmerringii*), presented by Charles M'Iver, jun., Esq., on the 29th of November.

Mr. M'Iver informs me that the animal was obtained in the desert about 100 miles south of Suez.

Mr. Sclater read the following extracts from a letter addressed to him by Dr. Burmeister, F.M.Z.S. (dated Buenos Ayres, Oct. 10, 1871), containing some remarks on Messrs. Sclater and Salvin's Synopsis of the Cracidæ (P. Z. S. 1870, p. 504):—

1. *Mitua tuberosa*, P. Z. S. 1870, p. 520.—We have a magnificent male of this species from Santa Cruz de la Sierra, in Bolivia, where a collector from Buenos Ayres has lived some years, and made a valuable collection. My specimen is beautiful, 31 inches long, and of very splendid colours.

2. *Crax sclateri*, ibid. p. 515.—We have a beautiful female of this *Crax*, also from Santa Cruz de la Sierra, and another young female from Paraguay, the latter being somewhat smaller, and not so strongly coloured; but the differences are not of importance.

3. *Pipile cumanensis*, ibid. p. 529.—We have two specimens of this species, also from Santa Cruz de la Sierra, both excellent skins and entirely perfect. The white *pileus* advances to the beak, and is divided on the neck into two stripes, one on each side, descending nearly to the end of the neck. In all other respects it agrees with your description.

4. *Penelope boliviana*, ibid. p. 526.—Of this species also two specimens are in our collection from the same locality, agreeing with your definition, but larger, of 30 inches total length, and the feathers of the *pileus* all bordered with whitish, like those of the neck and back. The underside is obscure castaneous down to the beginning of the breast, but here mixed with greenish brown, like the back *.

5. *Ortalida guttata*, ibid. p. 536.—This bird we possess from the same locality, entirely corresponding with your definition.

6. *Ortalida canicollis*, ibid. p. 534.—This is the only species of the Penelopine group occurring in the interior of this country,

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* It seems more probable that this may be *Penelope sclateri*, G. R. Gray.—P. L. S.

and advances furthest to the south. I have seven specimens from the woody district of Tucuman, near Invernada (see my La-Plata Reise, ii. p. 499), where the bird was found to be common. It is esteemed good meat, and I have eaten it with pleasure.

The species named in the same work *Penelope pipile* is that which you call *Pipile cumanensis*, and occurs also, but rarely, in the woods of Tucuman, where is likewise found, and not so rarely, *Penelope boliviana*. I have seen there two specimens just killed in the woods, and presented to a friend of mine, who was intending to make a good dinner of them with his friends. It is also said that a species of *Crax* lives in the same forests; but I have not yet seen specimens of it. I suppose it must be *Crax sclateri*.

Mr. Sclater exhibited a skin of the Water-Opossum (*Chironectes variegatus*), which had been sent to him by Mr. Robert B. White, C.M.Z.S., from Medellin, U.S. of Columbia. Mr. White stated that this animal was abundant in the river Medellin (a confluent of the Cauca), which, Mr. Sclater observed, was quite a new locality for it *.

Dr. E. Hamilton exhibited a skull of the new Chinese Deer lately described by Mr. Swinhoe (P. Z. S. 1870, p. 89) as *Hydropotes inermis*, and made the following remarks:—

"I exhibit an adult shull of *Hydropotes inermis*, being the first mature specimen which has been sent to this country, those obtained by Mr. Swinhoe being the skulls of young animals. The animal from which this skull was taken was shot in the beginning of this year by Mr. T. Annett in the marshy grounds bordering the Yangtsze river, about forty miles from Shanghai. I shall leave the minute description of the skull of this interesting animal to those more qualified than I am, merely remarking that this skull differs from the general description given by Mr. Swinhoe in its larger size, measuring 7 inches in length. There are also six perfect molars on each side, in Mr. Swinhoe's specimen only five. The canine teeth measure 2¾ inches when out of the jaw, 2 inches when *in situ*; in Mr. Swinhoe's specimen they measure only 1·1. Unfortunately the lower jaw has been lost in its transmission to England, probably at the Custom House. Another interesting circumstance is, that Mr. Annett corroborates Mr. Swinhoe's remarks as to the fecundity of this animal; he has constantly found five and six fœtuses in the doe when they have gralloched the deer, as is customary immediately after it is shot."

Professor Newton exhibited the humerus of a species of Pelican found during the past summer in Feltwell Fen, Norfolk, and presented to the Museum of Zoology at Cambridge by Mr. J. H.

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* I was not aware, when these observations were made, that *Chironectes* occurs as far north as Costa Rica (see v. Frantzius in Wiegm. Arch. 1869, i. p. 318).—P. L. S.

Gurney, jun., F.Z.S. Professor Newton remarked that though the present specimen was certainly adult, it did not bear out the observation of Professor Alphonse Milne-Edwards (Annales des Sc. Nat. Zool. ser. 5, vol. viii. p. 285) as to the larger size of the Pelican of the English Fens when compared with extant species, and exhibited in proof of this remark a humerus of a Pelican sent from Kustendji by Dr. Cullen, and believed to belong to *Pelecanus crispus*, as well as the humerus of the Fen-Pelican which had been shown to the Society on a former occasion (P. Z. S. 1868, p. 2), and which had been the subject of Professor Milne-Edwards's description.

The following papers were read :—

1. On the Freshwater Siluroids of India and Burmah. By Surgeon Francis Day, F.Z.S. & F.L.S., Inspector-General of Fisheries of British India.

[Received November 6, 1871.]

Having during the last few months been engaged in inspecting the fisheries of the Ganges, Jumna, and some of the tributaries of the Indus, I have drawn up the following sketch of the family *Siluridæ* as existing there, as well as of its ramifications towards the Malay archipelago. I have also received specimens of *Olyra* and *Akysis* collected by Mr. Kurtz from the hilly regions of Pegu, as well as two small but very interesting collections from Mr. Mundali from below Darjeeling, and a new form of *Hara* from a stream between Purneah and the Garrow hills.

I propose first to make remarks on species with reference to undescribed ones, corrections of identification, and the character of the air-vessel, with observations on the range of the genus; secondly, on their classification; and lastly, on their geographical distribution.

AKYSIS KURZII, sp. nov.

D. $\frac{1}{6}|0$. P. $\frac{1}{7}$. V. 6. A. 11. C. 17.

Length of head nearly $\frac{1}{5}$, of caudal $\frac{2}{9}$, height of body $\frac{1}{5}$, of dorsal fin $\frac{1}{6}$ of the total length.

Eyes subcutaneous, situated at the commencement of the anterior two fifths of the head.

Lower jaw somewhat the longest, mouth terminal; nostrils some distance apart, with a barbel between them belonging to the posterior one. Barbels eight, slightly dilated at their bases, the maxillary extending to beyond the end of the pectoral fin, the external mandibular to opposite its middle, whilst the internal is as long as the head, as is also the nasal. Gill-openings wide, not confluent with the skin of the isthmus, and extending to opposite the middle of the opercle. Free portion of tail longer than high.

Teeth in a wide villiform band, none on the palate.

Fins. Dorsal situated entirely in advance of the ventrals, spine strong, two fifths as long as the head, and enveloped in skin. Pectorals horizontal. Adipose dorsal low, shorter than the rayed fin. Anal with its posterior rays longest. Caudal very deeply forked.

Skin smooth.

Lateral line present.

Air-vessel small, in the abdominal cavity, not enclosed in bone.

Colours. Uniform brown.

Hab. Pegue Yomas.

One specimen of this small species was collected in 1871 by S. Kurz, Esq., after whom I have named it. The genus extends to the Malay archipelago, but has not yet been recorded from India.

Genus HARA, Blyth.

Air-vessel rather large (*H. buchanani*) and situated in the abdomen, not enclosed in bone.

HARA ELONGATA, sp. nov.

D. $\frac{1}{6}|0$. P. $\frac{1}{6}$. V. 6. A. $\frac{2}{7}$. C. 17.

Length of head $\frac{2}{13}$, of caudal $\frac{1}{4}$, height of body $\frac{1}{7}$ of the total length, *Eyes* small, situated in the posterior half of the head.

Gill-opening narrow, extending from opposite the upper margin of the opercle to the thoracic surface, on to which, however, it is scarcely continued, but where its gill-membrane joins a very thick isthmus. No groove behind the chin. Barbels generic, maxillary ones reach the gill-opening. Occipital process three times as long as wide at its base; humeral process about half as long as the pectoral spine, and with one oval-shaped ossicle posterior to it. The process intermediate between the occipital and humeral ones is much longer than either, and rather deflected at its posterior extremity. Basal bone of dorsal fin very slightly dilated.

Fins. The base of the anal one half longer than that of the first dorsal, adipose fin short. Dorsal spine stout, laterally compressed, very strongly denticulated anteriorly, slightly so posteriorly; it is as long as the head. Pectoral spine one fourth longer than the dorsal, serrated on both edges, but most strongly so externally; the fin reaches the ventral, which last extends two thirds of the distance to the base of the anal. Caudal very deeply forked, the outer rays in both lobes being prolonged.

Skin covered with blunt spines, those on the body mostly directed backwards.

Lateral line as in *H. buchanani*.

Colours. Brownish, banded. Pectoral, ventrals, and anal yellow, each having a black band. Some black markings also on caudal and dorsal.

Hab. A stream near the Garrow hills.

One specimen 2¼ inches long. The genus appears to extend from the Kistna through Assam to Burmah, but has not been recorded further to the east.

Genus Macrones, Duméril.

Pseudobagrus, Bleeker.

This genus possesses about twenty known representatives on the continent of India and in Burmah; but previously to describing some individuals I will give my reasons for considering *Pseudobagrus* a synonym of *Macrones*.

The genus *Macrones* includes species with less than twenty rays in the anal fin; *Pseudobagrus* those possessing twenty or upwards, the other differences being:—in the first the dorsal fin has one spine and seven rays; in the second, one spine and from five to seven rays.

If we examine the species, we see amongst them the following:—*Macrones keletius*, A. 9; *M. leucophasis*, A. 10; *M. cavasius*, A. 11; *M. carcio*, A. 12–13; *M. tengana*, A. 14; *M. batasio*, A. 16; whilst the *Pseudobagrus aurantiacus* has A. 20–22; *P. vachellii*, A. 23–24; *P. chryseus*, A. 27,—thus showing a regular gradation.

The subgenera, or those with a separate interneural shield on the nape and those destitute of such, appear, at least sometimes, to denote other internal structural differences in those which I have examined. Amongst the former are *M. aor* and *M. lamarrii*, in which the anterior portion of the air-vessel is attached to the under surface of the bodies and expanded processes of the anterior vertebræ, but its posterior extremity is elongated and pyriform; internally it has a longitudinal septum.

On the contrary, in those not having this separate shield, the posterior extremity of the air-vessel is not elongated, the longitudinal septum (as in all those of this genus which I have examined) has a communicating opening anteriorly; and sometimes there are transverse partitions forming chambers, which freely communicate with those on the same, and by means of the anterior one with those on the opposite side, as in *M. cavasius*, *M. tengara*, *M. carcio*.

Amongst the species of this genus are several but slightly known, and others which I believe have been erroneously identified.

Macrones carcio, H. B. pl. 23. f. 60.

D. $\frac{1}{7}|0$. P. $\frac{1}{9}$. V. 6. A. $\frac{2-3}{9-10}$. C. 19.

The figure in the 'Gangetic Fishes' marked *Pimelodus batasius* belongs to this species. In Hamilton Buchanan's MS. drawings* is a figure of the latter $3\frac{2}{10}$ inches long, showing, as he observes in the text, that none of the barbels are as long as the head.

Groove on the summit of the head extends to midway between the posterior edge of the orbit and the base of the occipital process.

Fins. Dorsal spine slightly serrated anteriorly in its upper third and also along the whole of its posterior surface, its length being equal to half that of the head; the adipose fin commences some distance behind the first dorsal, and the extent of its base is from one third to one half more than that of the base of the first dorsal. Pectoral spine as long as the head without the snout, and armed internally with about fifteen strong teeth.

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* Concerning identifications of Hamilton Buchanan's MS. drawings and the British-Museum Catalogue, see article in the 'Proceedings of the Asiatic Society of Bengal,' September 1871.

Air-vessel large, heart-shaped, divided internally into two lateral cavities by a fibrous partition, which, however, possesses a large oval opening anteriorly, thus permitting a free communication between the two chambers.

The species is fully described in the 'Catalogue of Fishes of the British Museum' (vol. v. p. 81) under the name of *Macrones tengara*.

MACRONES TENGARA, H. B. pl. 3. f. 61.

D. $\frac{1}{7}|0$. P. $\frac{1}{8}$. V. 6. A. $\frac{3}{7}$. C. 19.

Length of head $\frac{1}{5}$, of caudal $\frac{1}{5}$, height of body $\frac{1}{5}$ of the total length.

Eyes. Diameter $\frac{2}{9}$ of length of head, $1\frac{1}{2}$ diameter from end of snout and apart.

Groove on the summit of the head extends to the base of the occipital process, which latter is roughened in lines, and about two fifths as wide as long. Nasal barbels half as long as the head, the maxillary reach the base of the caudal fin, the external mandibular the middle of the pectoral, whilst the internal are shorter.

Fins. Dorsal spine weak, nearly half as long as the head, and smooth on both edges; adipose fin (as is well shown in the figure) commences just behind the base of the first dorsal, as which it is nearly three times as long. Pectoral spine as long as the head to the middle of the eye; it has about ten moderate-sized teeth internally, and is finely serrated externally. Caudal lobed, the upper the longer.

Colours. Brownish yellow, with three longitudinal broad brown bands, and a black blotch on the shoulder.

MACRONES VITTATUS, Bl.

Bagrus oculatus, Cuv. et Val.
Bagrus montanus &c., Jerdon.
Macrones armatus, Day.
Hab. Madras Presidency, Mysore, and the western coast of India.

MACRONES GULIO, H. B. pl. 23. f. 66.

Air-vessel large, heart-shaped, having a longitudinal septum internally, which has a connecting opening in its fore part. The lateral compartments are subdivided by transverse partitions, which communicate with those of the same side.

MACRONES MENODA, H. B. pl. 1. f. 72.

Bagrus trachacanthus, Cuv. et Val.
Hab. Large rivers of Bengal, Orissa, and Burmah.

MACRONES TENGANA, H. Buch., Fishes of Ganges, pp. 176, 377, pl. 39. f. 58.

B. vi. D. $\frac{1}{7}|0$. P. $\frac{1}{8}$. V. 6. A. $\frac{4}{10}$. C. 15.

Length of head $\frac{1}{4}$, of caudal $\frac{1}{4}$, height of body $\frac{1}{4}$ of the total length.

Eyes of moderate size, situated nearer the snout than the posterior half of the head.

Width of head equals its height, and is as long as the head without the snout. Groove on the summit of the head lanceolate in its posterior half and extending to the base of the occipital process, which is twice as long as wide at its base, and reaches the basal bone, which is V-shaped. Nasal barbels extend to the posterior margin of the orbit, the maxillary to the middle or end of the pectoral fin, the external mandibular are as long as the head, the internal shorter.

Teeth in an uninterrupted crescentic band on the palate.

Fins. Dorsal spine smooth, as long as the head without the snout, whilst the fin is as high as the body below it; adipose fin small, its base shorter than that of the first dorsal. Pectoral spine as long as the head without the snout; it is strongly serrated internally. Caudal deeply lobed, the upper slightly the longest.

Colours. Golden, with three or four longitudinal bands formed of black spots in the upper one along the back, and black stars in the lower ones. A darkish blotch formed of spots over the base of the pectoral fin; some spots on the dorsal and the margins of the other fins stained.

Hab. Assam and the Punjaub; attaining about 3 inches in length.

Hamilton Buchanan observes, all the barbels are shorter than the head; but my specimens so exactly resemble his figure and description, except in the maxillary barbels being longer (and they varied in individuals), that I consider they must be the same. I took upwards of twenty in a tank near Goordaspoor in the Punjaub.

This genus, containing mostly only inhabitants of fresh waters, still has estuary or marine representatives (*M. gulio*, H. B.). It is found generally throughout India and Burmah, down to the Malay archipelago.

Rita crucigera, Owen.

Pimelodus rita, Ham. Buch. pl. 24. f. 53.

I have found this species throughout the extent of the Ganges and Jumna, and also in the Punjaub rivers; but it is subject to considerable variation, due to age and locality. The dorsal spine may be as long as, or longer than, the head, the pectoral being somewhat shorter, whilst the humeral process, although not pointed, is but very slightly rounded.

Air-vessel with a thick outer coat and thin lining membrane. Its external form is somewhat quadrangular; and posteriorly it is continued into two horn-like processes, nearly or as long as the abdominal cavity; the right one usually passing over to the left side and curving across the commencement of the left one, whilst the left one first passes downwards and then is sometimes recurved on itself. On the front wall being removed a longitudinal median partition is seen in its posterior half, dividing it into two large smooth cavities, which anteriorly communicate, and are continued posteriorly down the horn-like or tubular processes.

This genus extends throughout the larger rivers of India and the Punjaub and Burmah. *Arius manillensis*, Cuv. et Val., may, however, belong to the genus, although, as its specific name implies, it is stated to have come from Manilla.

Genus ARIUS.

In the species of this genus which I have examined the air-vessel is enclosed in bone; but a short time since the following remark by Dr. Taylor of Dacca, published in the 'Gleanings in Science' (vol. ii. 1830), made me desirous to obtain *A. gagora* before I completed this paper; this I have now accomplished. Dr. Taylor observes, "in the *Pimelodus gagora* there are two air-vessels, lodged one on each side in an osseous cup, attached by a narrow neck to the body of the first vertebra, close to its junction with the cranium." He goes on to describe what he found; but it could not have been in *Arius gagora*, H. B. In Owen's 'Comparative Anatomy' (vol. i. p. 491) it is stated of the air-bladder of fishes that it is "seldom divided lengthwise into two bladders (*Arius gagora, Polypterus, Lepidosiren*, fig. 324)."

ARIUS GAGORA, Ham. Buch. pl. 10. f. 54.

Air-vessel large and somewhat heart-shaped, with a moderately thick external fibrous coat. On removing its front wall a longitudinal partition becomes apparent, but is not extended to its anterior portion. It has three transverse subdivisions, forming it into five cavities, owing to the longitudinal partition commencing at the first transverse subdivision. These lateral cavities freely communicate with one another on the same side, and with the opposite ones by means of the anterior chamber, which does not possess any subdivision.

This is the only species of the genus which I have found in fresh water high up rivers, having taken it at Mandalay in Native Burmah, about 650 miles from the sea.

ARIUS JATIUS.

Pimelodus jatius, H. B.

Amongst many specimens that I have obtained in Calcutta this year the anal rays were nineteen or twenty; and I can indorse Hamilton Buchanan's and Mr. Blyth's observations as to the difficulty of seeing the granular palatine teeth. I believe, from the description, that *A. macracanthus*, Günther, reputed to have been obtained from Siam, is this species.

ARIUS SONA.

Pimelodus sona, H. B., appears to be the *Bagrus gagorides*, Cuv. et Val.

ARIUS NENGA.

Pimelodus nenga, H. B. (MS. figure), appears to be the *Bagrus arioides*, Cuv. et Val.

The genus *Arius* is found throughout the seas and estuaries of India, Ceylon, Burmah, the Andaman and Nicobar Islands; it also extends to most of the tropical regions. In India it is strictly marine, but enters rivers often to a long distance from their mouths. Whether it breeds in the fresh waters is questionable.

OSTEOGENIOSUS VALENCIENNESII, Bleeker.

In a specimen from Moulmein, taken in the river, the air-vessel was large, heart-shaped, having an internal longitudinal septum, and not enclosed in bone.

Geographical distribution.—A marine genus, extending through the seas of India to the Malay archipelago. Some enter the mouths of rivers.

PANGASIUS BUCHANANI, Cuv. et Val.

Pimelodus pangasius, H. B. pl. 33. f. 52.

Air-vessel large, extensive, and divided into three portions. The anterior is somewhat heart-shaped, considerably the largest, and extends from the commencement of the vertebral column to nearly opposite the posterior extremity of the pectoral fin. Its remaining portions are narrow, compressed, and continued to opposite the middle of the anal fin, amongst the muscles covering the hæmal spines. It then becomes narrow and reduplicated on itself for a short distance. On removing the front wall of its first or largest portion, its interior is seen to consist of two pear-shaped cavities, the bases of which are inferior and lateral, whilst they coalesce anteriorly; the whole of the posterior half of this portion is cellular; and so is the small intermediate space between the two uncelled pyriform portions. The two posterior divisions of the air-vessel have valvular-shaped folds partially subdividing its interior.

Geographical distribution.—The Indian species is found within tidal influence, as well as inland in the larger rivers far beyond the tides. The genus extends through Burmah to the Malay archipelago.

Genus PSEUDEUTROPIUS, Bleeker.

Schilbichthys, sp., Bleeker.

Air-vessel in *P. garua*, H. B., small and somewhat heart-shaped, it is closely attached to the bodies of the anterior vertebræ; its external fibrous covering is of moderate strength. In *P. atherinoides*, Bloch, it is of a large size, as wide as the abdominal cavity, and on removing its front wall a longitudinal septum is seen dividing it into lateral portions, which, however, communicate anteriorly. In some there is a further subdivision in its posterior portion. In some of the larger species (as *P. murius*, H. B., and *P. goongwaree*, Sykes) the air-vessel is larger than in *P. garua*, and comparatively considerably smaller than in *P. atherinoides*, Bloch, *P. garua*, in which the adipose dorsal is so small, and altogether absorbed in the adult, has the smallest air-vessel amongst the larger species which I have examined.

The genus extends throughout India and Burmah.

CALLICHROUS EGERTONII, sp. nov.

Palloo, Punj.

D. 4. P. $\frac{1}{12}$. V. 8. A. 52–54. C. 17.

Length of head about $\frac{1}{5}$ ($\frac{4}{21}$), of caudal $\frac{1}{8}$, height of body $\frac{1}{5}$ of the total length.

Eyes. Diameter $\frac{1}{6}$ of length of head, 2 diameters from end of snout.

Snout obtuse, rounded; lower jaw strongly prominent. Maxillary barbels extend a little beyond the base of the pectoral fin, the mandibular pair are nearly half as long as the head.

Teeth vomerine, in two separate patches.

Fins. Dorsal very narrow; pectorals rounded, rather longer than the head without the snout, its spine moderately strong, nearly as long as the postorbital portion of the head, and strongly denticulated internally; anal terminating close to the caudal, but separated from it; the latter fin forked in its posterior half, its upper lobe the longest.

Colours. Olive, shot with purple and gold, its body and fins covered with blotches of a brownish colour; a large black finger-mark over the posterior half of the pectoral spine.

Hab. Subhimalayan range in the Punjaub.

I have named the species after the Hon. R. Egerton, from whom I have received great assistance in my investigations.

Geographical distribution.—This genus extends throughout India and Burmah to the Malay archipelago. The distinctions between *Cryptopterus*, Bleeker, in the extended sense as accepted by Dr. Günther, and *Callichrous* seem to show the unadvisability of separating them into distinct genera.

Genus WALLAGO, Bleeker.

Air-vessel of moderate size, situated in the anterior part of the abdomen; on removing its front wall it is found to be divided into two lateral chambers by a longitudinal septum, which, however, has a rounded orifice anteriorly, so as to admit of free communication between the two sides.

Geographical distribution.—India, Burmah, and the Malay archipelago.

Genus OLYRA, M'Clelland.

Dorsal profile nearly horizontal, neck not elevated. Body low and elongate. Head depressed, superiorly covered with soft skin. Mouth terminal, transverse; jaws about equal in length, or the lower the longest. Nostrils remote from one another, the posterior provided with a barbel. Gill-openings wide, the membrane not confluent with that of the isthmus. Barbels eight. Eyes small, subcutaneous. Villiform teeth on the jaws and palate. First dorsal fin without a spine, and having six to eight rays; adipose dorsal long and low; anal of moderate length (fifteen to twenty-three rays); ventral inserted below the dorsal, and having six rays. Caudal rounded or lanceolate. Air-vessel not enclosed in bone. Skin smooth.

Olyra burmanica, sp. nov.

D. 8 | 0. P. $\frac{1}{4}$. V. 6. A. 16. C. 17.

Length of head $\frac{2}{15}$, of caudal $\frac{1}{3}$, height of body $\frac{1}{15}$, of dorsal fin $\frac{2}{15}$ of the total length.

Jaws of nearly equal length; head depressed; opercles rather pointed. Eight barbels, without dilated bases, of which the maxillary are the longest, almost reaching the base of the ventral fin; the external mandibular are as long as the head. Nostrils patent, wide apart, the posterior provided with a barbel, the anterior just over the snout but not in front of it. Gill-openings wide, the membrane not confluent with the isthmus, and extending laterally to opposite the point of the opercle.

Teeth villiform in both jaws, the outer row slightly the largest. An uninterrupted horseshoe-shaped band across the palate.

Lateral line present. Skin smooth.

Air-vessel large, thin, and not enclosed by bone.

Fins. Dorsal without any osseous ray, its first the shortest, the fin commences opposite the ventrals; adipose dorsal very long and low. Pectoral spine rather strong, slightly serrated externally, coarsely so internally; the fin only extends halfway to the ventral. The anal rays increase in length to the last. Caudal with its central rays strongest and elongated, making the fin one third of the total length.

Colours. Dark brown.

Hab. Pegue Yomas.

I am indebted to S. Kurz, Esq., for two specimens, collected by him in 1871.

Geographical distribution.—Khasya hills, where M'Clelland obtained *O. longicaudata* and *O. laticeps*, to the Pegue hills.

Silurus cochinchinensis, Cuv. et Val.

Air-vessel in the abdominal cavity, not enclosed in bone.

Geographical distribution.—Besides the specimen recorded by Blyth from Burmah, and the one I obtained from near Akyab, I have now received two more from below Darjeeling collected by Mr. Mundali. This species consequently extends from near Darjeeling, in the Subhimalayan range, to Cochin China, perhaps being confined to the vicinity of hills. The genus, however, has a much wider range,—one species existing in the Wynaad Hills on the Malabar coast; another is recorded from Afghanistan; and it extends into Europe, where the *S. glanis* exists. The genus *Silurichthys* is distributed from Cashmere to the Malay archipelago and China; and the distinctions between the two genera, as at present defined, appear to be but slight.

PLOTOSUS CANIUS, H. B. pl. 15. f. 44.

Air-vessel of moderate size, placed transversely across the anterior vertebræ. Its external fibrous coat is thick, whilst internally it is divided by a longitudinal septum into two lateral cavities, which communicate anteriorly by a large circular opening.

Geographical distribution.—This genus contains marine and estuary fishes; but *P. canius* is sometimes captured in fresh water. The genus has a very extensive range, being found in Africa, Asia, through the Indian seas to the Malay archipelago, and even beyond it.

CLARIAS MAGUR, H. B. pl. 26. f. 45.

Air-vessel tubular, placed transversely across the body of the anterior vertebræ, where it is entirely enclosed in a bony capsule. This subject is remarked upon in Cuv. and Val.

Geographical distribution.—The genus is found in Africa, India, Ceylon, Burmah, throughout the Malay archipelago, even to beyond it.

SACCOBRANCHUS FOSSILIS, Bl.

Silurus singio, H. B. pl. 37. f. 46.

Air-vessel small and situated transversely across the body of the anterior vertebræ, either extremity being enlarged, globular, and enclosed in a bony capsule. Cuv. and Val. remark upon this.

Geographical distribution.—The genus extends through India, Ceylon, Burmah, and, according to Dr. Günther, Cochin China.

SILUNDIA GANGETICA, Cuv. et Val.

Pimelodus silondia, H. B. pl. 7. f. 50.

Air-vessel small and placed transversely across the body of the anterior vertebræ, where there is a groove to receive its posterior surface; anteriorly it has a thick, strong, fibrous covering. There is a low osseous process from the vertebra, giving it protection laterally. The air-vessel itself consists of two small oval portions, having a median connecting tube; and this lateral part is surrounded by osseous or strong fibrous walls.

Geographical distribution.—Large rivers of India and Burmah.

AILIA BENGALIENSIS, Gray.

Air-vessel as in the following genus.

Geographical distribution.—Rivers of the plains of India (except in Madras), extending to the upper portions of the Ganges and Jumna, but not on to the hills; also Assam.

Genus AILIICHTHYS, gen. nov.

Differing from *Ailia* in that the ventral fins are entirely absent.

Geographical distribution.—The Jumna, and southern rivers in the Punjaub that are tributaries of the Indus, but not those on the hills.

AILIICHTHYS PUNCTATA, sp. nov.

P. $\frac{1}{12}$. A. 76–82. C. 17.

Length of head $\frac{1}{7}$, of caudal $\frac{1}{5}$, height of body $\frac{2}{11}$ of the total length.

Eyes situated more than half below the angle of the mouth, being partly on the lower side of the head. Diameter $\frac{1}{3}$ of length of head, $\frac{1}{2}$ a diameter from end of snout, 1 diameter apart.

Body compressed, upper profile of head somewhat concave.

Upper jaw slightly the longest, the cleft of the mouth only extending about halfway to the anterior margin of the eye, opposite to its centre. Barbels all much of the same length, reaching to the middle of the length of the fish.

Teeth villiform in the jaws.

Fins. Adipose dorsal minute. Pectoral spine one half longer than the head. Ventrals absent. Caudal forked, lower lobe the longest.

Air-vessel tubular, placed across the bodies of the anterior vertebra, and more or less enclosed in bone.

Colours. Silvery, upper surface of head nearly black, a large black spot before the base of the caudal fin.

Hab. Jumna at and below Delhi, also in the Lower Punjaub rivers. It is rather numerous, apparently more common in the Punjaub than the *A. bengaliensis.* I obtained numerous specimens up to 4 inches in length.

EUTROPIICHTHYS VACHA, H. B. pl. 19. f. 64.

Air-vessel narrow, tubiform, placed transversely across the body of the anterior vertebræ, and all but its central portion enclosed in bone, either expanded extremity being within a bony capsule.

Geographical distribution.—Large rivers of India and Burmah. It appears to prefer estuaries and the lower portion of rivers.

Genus SISOR, H. B.

Air-vessel. Having only small specimens to dissect, a further examination of this species is desirable. Subvertebral bony capsules were present, and apparently contained an air-vessel, whilst none could be detected in the abdomen.

Geographical distribution.—Ganges and Jumna rivers.

Genus GAGATA, Bleeker.

PIMELODUS GAGATA, H. B. pl. 39. f. 65.

Air-vessel in two globular portions, enclosed in bony capsules, placed on either side of the body of the anterior vertebræ, and having a transverse communicating tube.

Geographical distribution.—Large rivers of India and Burmah, and generally not far from their mouths.

Genus HEMIPIMELODUS, Bleeker.

In both *H. cenia,* H. B., and *H. viridescens,* H. B., the air-vessel is placed transversely across the body of the anterior vertebræ. It has an expanded globular portion on either side enclosed in a bony capsule, and with a transverse connecting tube.

Geographical distribution.—Central India, Jumna, and Ganges, and through Burmah to the Malay archipelago.

Genus BAGARIUS, Cuv. et Val.

Air-vessel small, consisting of two round portions situated on either side of the body of the anterior vertebræ and partially enclosed in bone. (For a detailed description, see Taylor in 'Gleanings in Science,' 1830.)

Geographical distribution.—Throughout the large rivers of India.

Genus PSEUDECHENEIS, Blyth.

Air-vessel in two rounded lateral portions, each of which is enclosed in a bony capsule.

Geographical distribution.—The Subhimalayas below Darjeeling, and on the opposite side of the Brahmaputra, on or near the Khasya hills.

Genus GLYPTOSTERNUM, M'Clelland.

Air-vessel in two rounded lateral portions and enclosed in bony capsules.

GLYPTOSTERNUM STRIATUM, M'Clelland.

I have obtained this species with from nine to eleven anal rays, and I suspect *G. reticulatus* and *G. pectinopterum*, M'Clell., to be synonyms. It is found in the rivers of the lower plateau of the Himalayas, down to those of the plains; and a most remarkable difference is perceptible in specimens from these two situations. Only small ones are taken on the hills; and these have the pectoral and ventral rays plaited inferiorly, more especially in the young, evidently to enable them to adhere to the rocks, and by these means, with the assistance of the adhesive sucker on the chest, to withstand the impetuosity of the mountain-torrents. I took larger ones in the Beas near the plains; and in them this plaiting was either very indistinct or entirely absent, whilst there cannot be a doubt as to the identity of the species.

GLYPTOSTERNUM DEKKANENSE, Günther.

I found this species tolerably abundant in the Jumna, near where it emerges from the Sewalik hills.

GLYPTOSTERNUM MODESTUM, sp. nov.

D. $\frac{1}{6}|0$. P. $\frac{1}{8}$. V. 6. A. $\frac{2}{7}$. C. 15.

Length of head $\frac{1}{5}$, of caudal $\frac{2}{11}$, height of body $\frac{2}{13}$ of the total length.

Eyes small, superior, situated in the middle of the length of the head.

Head as broad as long, depressed, covered with skin. Snout broad. Caudal peduncle two thirds as high as long. Thoracic adhesive apparatus small. Gill-membranes generic. Lips not fringed. Maxillary barbels with broad bases, and nearly as long as the head, the nasal reaching halfway to the orbit, the external mandibular pair longer than the internal. Occipital process slightly longer than it is broad at its base.

Fins. Dorsal nearly as high as the body, its spine half as long as the head and enveloped in skin; adipose dorsal rather low, its base slightly longer than that of the first dorsal. Pectoral spine broad, reaching two thirds of the distance to the base of the ventral, not plaited inferiorly, whilst externally it is smooth, and internally has seven strong denticulations; it is two thirds as long as the head. Caudal forked, lower lobe slightly the longer.

Skin smooth. Air-vessel generic.

Colours. Uniform brown.

Hab. Numerous specimens up to 3 inches long from the upper portion of the Jumna.

Geographical distribution.—Throughout India (? Madras), Burmah, to the Malay archipelago. Some species when small appear to be found in mountain-streams.

Genus Exostoma, Blyth.

Air-vessel in a globular form on either side of the body of the anterior vertebræ, and enclosed in bone.

Exostoma blythii, Day, Proc. Zool. Soc. 1869, p. 525.

D. $\frac{1}{6}\big|0$. P. $\frac{1}{17}$. V. 6. A. $\frac{2}{5}$. C. 13.

An erratum occurred in the original description in the number of anal rays, which are seven, the two first of which are undivided.

Having been favoured by Mr. Mundali and Dr. Stoliczka with several specimens up to $3\frac{2}{10}$ inches in length, I find its habitat to be the rivers below Darjeeling.

In some of the larger specimens the caudal fin is not lobed, but its outer rays are rather elongated, whilst all the intermediate ones are of the same length.

Geographical distribution.—This genus, so far as I have been enabled to trace its species, commences in the rivers below Darjeeling (*E. blythii*); it is then found in the Mishnee mountains in Assam (*E. labiatum*); more to the east it has its representatives in Tenasserim (*E. berdmorei*); whilst specimens were brought by the expedition which went through Upper Burmah to China (*E. andersonii*).

The systematic arrangement of the family *Siluridæ* has always been found intricate, judging from the constant changes to which it has been subjected. Although I have no new system to propose, I would draw attention to some points respecting those genera which inhabit the waters of India, which seem to show that further alterations will be necessary, by all who consider a natural arrangement preferable to an artificial one.

During the past year I have examined as many Indian Siluroids as I have been able to obtain in order to discover the character of their air-vessels*—a subject which was commenced by Dr. Taylor of Dacca in the 'Gleanings of Science' (vol. ii. 1830), a paper which I only obtained for the first time in September 1871. Cuv. and Val. have also some remarks on the air-vessels of *Saccobranchus* and *Clarias*.

Having in 1869, whilst in Orissa, discovered that the air-vessel of *Gagata typus*, Bleeker, possessed a bony capsule, and since then that several other Siluroids had this organ similarly protected, I proposed to obtain, if possible, species of every Indian genus, in order to institute a general examination of those of the family.

The *Cyprinidæ* of India are divisible into three subfamilies, one of the chief characteristics of which are:—first, the air-vessel free in the abdominal cavity, elongated, and with a transverse constriction (*Cyprinina*); or divided into two lateral portions, partially or entirely enclosed in a bony capsule (*Cobitidina*); or absent (*Homalopterina*). From the opportunity I have had of obtaining specimens of all the Indian freshwater genera, excepting *Chaca*, I have now been enabled to ascertain the position and shape of this organ in the *Siluridæ*.

A far wider acquaintance with all the known genera of this family is desirable before any definite conclusions can be arrived at; but sufficient materials exist in India to show that the present arrangement can hardly be continued.

In the Indian freshwater Siluroids (and for the sake of rendering this paper more complete I include those marine genera which ascend rivers for the purpose of obtaining food) there are two distinct divisions of air-vessels—those which are not enclosed in bone, and those which are.

Of those with the air-vessel not enclosed in bone we have *Akysis, Hara, Macrones, Rita, Arius, Batrachocephalus, Osteogeniosus,*

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* This subject appears, if one may form an opinion from the British Museum Catalogue, to have escaped Dr. Günther's attention. In vol. v., 277 pages are filled with an account of the family *Siluridæ* and the species composing it; but I only observe the air-vessel alluded to four times, as regards the Siluroids of India or the Malay archipelago:—first, that if present in the order Physostomi, it has a pneumatic duct (p. 1); secondly, that it is generally present in the family *Siluridæ*, communicating with the organs of hearing and by means of the auditory ossicles (p. 2); whilst at p. 38, in the definition of the genus *Cryptopterus*, it is observed, "air-bladder transparent through the sides of the body;" and at p. 40, of *C. limpok*, "this species appears to have the place behind the head, where the air-bladder is seen through the transparent skin, of a dark colour during life." I allude to the above in full to obviate the possibility of its being supposed that I wish to create any erroneous impressions respecting Dr. Günther's valuable ichthyological writings (see Zool. Record for 1869). Nothing is further from my wish, which is to obtain *facts*, no matter who the author may be, and, if possible, to take nothing on trust from any naturalist, however excellent an observer he is, when I can examine into the matter myself.

Pangasius, *Pseudeutropius*, *Callichrous*, *Wallago*, *Olyra*, *Silurus*, *Plotosus*, whilst *Chaca* is at present doubtful. The general form of the air-vessels is elongated, or heart-shaped, some being posteriorly prolonged. Internally there is an internal septum dividing the organ into two lateral halves, which are sometimes further subdivided by transverse partitions. The central longitudinal septum has an orifice anteriorly affording communication with the two sides; whilst all the lateral chambers communicate with one another on the same, and by means of the anterior one with those on the opposite side.

Of those with the air-vessel wholly or partially enclosed in bone, we have *Clarias*, *Saccobranchus*, *Silundia*, *Ailia*, *Ailiichthys*, *Eutropiichthys*, *Sisor*, *Gagata*, *Hemipimelodus*, *Bagarius*, *Pseudecheneis*, *Glyptosternum*, *Amblyceps*, and *Exostoma*. The general form of these air-vessels is transverse, with the outer extremities usually dilated and enclosed in bone. Or the air-vessel may be in the form of two rounded lobes enclosed in bone, with a connecting tube, or else the pneumatic ducts coalesce a short distance before they enter the pharynx or upper portion of the alimentary canal.

This last division has much in it that is Loach-like in its smaller forms; and Mr. Blyth's observation of *Amblyceps*, a "*Cobitis*-like Siluroid," is still further apparent when we examine its air-vessel. Thus it gradually leads the Siluroids towards the *Cobitidina*.

I do not propose at present to enter further upon the subdivision of the Siluroids, as I hope those who have the opportunity of giving descriptions of the air-vessels of extra-Indian genera will do so, in order to ascertain whether this division is a natural one and applicable to the whole of the family*, as I anticipate it will be found to be.

The following notes upon the geographical distribution of these fishes are far from complete; but I deem it advisable to give them as they are, for were I to wait until all that is desirable is effected, I fear the paper would never be finished.

Previously to commencing the geographical distribution of the *Siluridæ*, I have some remarks to offer respecting the limits chosen and the terms employed.

By *India* or Hindoostan I understand the whole of the continent under British rule or protection, or independent native states when surrounded by British territory. *Burmah* includes Arracan and the Tenasserim provinces, whilst the designation *Ceylon* answers for itself.

The *East-Indian archipelago* has been commonly employed in zoology to express in a general way a large space variously limited or expanded by each fresh author, and is scarcely sufficiently defined when entering upon the distribution of freshwater genera or species of fish. I shall therefore employ Wallace's definition of the *Malay*

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* Any naturalist who wishes to exchange Tropical forms of Siluroids, personally collected, for those from Hindoostan, will always find me ready to meet his views. The reason why I wish them personally collected is that the localities may be correctly appended.

archipelago, down to which point my investigations have more or less been carried on. His limits of this archipelago, lying between Asia and Australia, extend from the Nicobars and the Tenasserim provinces on the west, to the Philippines on the east, thus forming its northern boundary; whilst the Solomon Islands beyond New Guinea define it on the east. This space he subdivides into five groups, which, for my purpose, it is unnecessary to enumerate.

My collections were made in Malabar, Madras, Orissa, and Lower Bengal, up the valley of the Ganges, in the North-West Provinces and the Punjaub, and through Burmah to as far as Mergui in Tenasserim. In this wide extent of country many fishes have doubtless escaped my observation; still I have obtained at least a general insight into their distribution. The facts recorded by Hamilton Buchanan, M'Clelland, Sykes, Blyth, and Jerdon are valuable, as either increasing one's knowledge of localities or verifying personal observations; some references, which I am doubtful about, I am compelled to omit, as when the author is not so accurate in his geography as is desirable for investigations of this description.

Siluroids inhabit all fresh waters in India and Burmah—some almost generally, others locally. For an explanation of this I must give a short description of these localities, especially with reference to their ichthyology. These pieces of water consist of rivers, lakes, or tanks, and jheels or swamps.

The rivers may be arbitrarily divided into three portions, viz.:—those existing in mountainous districts; secondly, from such to within tidal influence; and, lastly, the tidal portions. As certain visible results exist due to these three various localities, it will be necessary to explain what their local causes are.

The hill-rivers, or rather those which take their rise in hill-ranges, consist of two very distinct classes, namely those which have and those which have not alpine sources. Generally speaking, *the rivers which possess alpine sources*, as those which descend from the Himalayas, are chiefly replenished by the melting of snow at their origins during the hot months of the year, consequently a diurnal rise and fall in them is apparent, corresponding to the distance from their snowy sources. During the monsoon or rainy season, doubtless the rains also assist in the melting of the snow, exclusive of which, however, they are sufficient to fill the rivers in a spasmodic manner. They thus form torrents, rapidly rising and as rapidly subsiding. During the cold season, unreplenished by rains or melting snows, they dwindle down to a small size. Of the fish inhabiting these places, some of the Siluroids possess suckers or adhesive organs on their heads or chests, as is also perceived in the genera *Discognathus* and *Oreinus* amongst the Carps. By means of these suckers they retain their hold against rocks and thus prevent themselves from being washed away.

In the *rivers destitute of alpine sources*, as those of the Neilgherries and the Wynaad in Madras, where snow but rarely falls and never remains for months, we have a different state of affairs. Amongst these must be classed the substreams or affluents of the larger snow-fed rivers; and it is in these places that all the hill-fishes breed (if we except the Loaches).

The *rivers of the plains* are of course merely the continuations of those descending from the hills; but the daily rise from melted snows becomes less and less apparent the further we go from their snowy sources. They may be divided into two classes: in the first, as the Indus, Irrawaddy, &c., a fair supply of water is always present; the second class, as the Soane or the Cauvery, become nearly dry during the hot weather—this result of course being mainly due to their being replenished or not by melting snows.

The Siluroids are very extensively distributed in India and Burmah, where they appear to delight in muddy water, avoiding that which is clear, especially if it has a stony or gravelly bed. Some which are marine are only temporary visitors to the fresh waters, whilst others live entirely in fresh water; a few appear to live in estuaries, sometimes ascending the rivers, at others extending their range along the sea-coast, as necessitated by the abundance or absence of food.

A few small species always reside in the streams of mountains or in those flowing near their bases, whilst the larger forms prefer the rivers of the plains. Some inhabit tanks only; others prefer running water; whilst a few are common to both. Some of these fishes æstivate during the hot months of the year.

Cold does not appear to suit Siluroids, the number of genera and the species rapidly decreasing as cold climates are approached. Attempting to introduce some on to the Neilgherries a few years since, they perished on the journey and apparently from cold. All of these belonged to the division having the air-vessel not enclosed in bone. But this cannot be assumed as the reason; for I received two species belonging to this group from the Pegu hills (*Akysis* and *Olyra*), whilst I have also obtained *Silurus punctatus* from an elevation of 2500 feet in the Wynaad; in none of these situations, however, were the rivers snow-fed.

The Siluroid forms which I have collected from the snow-fed Himalaya rivers or those streams in the Subhimalayan range all belong to the division with the air-vessel small and enclosed in a bony capsule, as *Pseudecheneis*, *Glyptosternum*, *Amblyceps*, and *Exostoma*. There are, however, many other genera of this group which are not found on the hills.

Countries possessing large and muddy rivers in their plains, such as Burmah, are more suited for Siluroids than such localities as Madras, where the rivers are smaller, the waters clearer, and the beds more stony. When investigating the fish-fauna of large tracts of country this becomes very evident: thus at Hurdwar, near where the river Ganges debouches into the plains, the large Ganges canal commences; both the bed of the river and that of the canal are stony, the waters pretty clear, and Siluroids are rare. Near Dheeri and in the Soane river, which has a pebbly bed, it is exceedingly clear water when floods are absent; but few Siluroids are found there, and these mostly the little *Macrones carcio*, H. B. A few miles distant is the narrower, sluggish, but deeper and muddy Poon river, where Siluroids abound.

If we now examine the foregoing twenty-eight genera of Indian Siluridæ, fourteen will be found to have the air-vessel free in the abdominal cavity, and the remaining fourteen to have it more or less enclosed in bone. For facility of description I will divide them thus:—

1. *Air-vessel free in the Abdominal Cavity.*

Genera restricted to India, none; extending also into Burmah, (1) *Rita*, (2) *Hara*, (3) *Pseudeutropius*, and (4) *Silurus*; found in an intermediate hilly district*, (5) *Olyra*; restricted to Burmah, none; common to it and the Malay archipelago, (6) *Akysis*; found in India, Burmah, and the Malay archipelago, (7) *Macrones*, (8) *Callichrous*, (9) *Wallago*, (10) *Arius*, (11) *Osteogeniosus*, (12) *Batrachocephalus*, (13) *Pangasius*, and (14) *Plotosus*. As, however, (10), (11), (12), and (14) are, strictly speaking, marine, only entering rivers for predaceous purposes, I shall omit them, thus reducing the total to ten.

2. *Air-vessel more or less enclosed in Bone.*

Genera restricted to India, (1) *Ailia*, (2) *Ailiichthys*, (3) *Sisor*, (4) *Bagarius*, and (5) *Amblyceps*; extending also into Burmah, (6) *Saccobranchus*, (7) *Silundia*, (8) *Eutropiichthys*, and (9) *Gagata*; found in an intermediate hilly district, (10) *Pseudecheneis*; also extending into Burmah, (11) *Exostoma*; restricted to Burmah or peculiar to it and the Malay archipelago, none; found in India, Burmah, and the archipelago, (12) *Clarias*, (13) *Hemipimelodus*, and (14) *Glyptosternum*, which last, however, only appears to have one representative in the Malay archipelago.

Out of the foregoing twenty-four genera as restricted, seven only appear to extend from India throughout to the Malay archipelago, of which four have the air-vessel free and three have it enclosed in bone; but, of these last three genera, *Clarias* is distributed through Africa and Asia so very widely that its presence is not to be wondered at, whilst only three species amongst the last two genera are recorded from the Malay archipelago. This brings one to the proposition that *the necessity for this bony capsule to the air-vessel is greater in India and Burmah than in the Malay archipelago*; and, secondly, one is naturally led to the conclusion that *this protection is for the freshwater, not for the marine, Siluroids.*

It will now be necessary to briefly consider whether amongst these freshwater groups any general law of distribution holds good† which may furnish one with a clue to the reason for the existence of this osseous covering, whether such is for protection or whether a part of the auditory apparatus.

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* This intermediate hilly district appears to commence from about Darjeeling in the Subhimalayas to a line including the Khasia hills on the other side of Bramahputra, and extends to the hilly regions towards or in Burmah. It has yet to be fully explored zoologically.

† I do not enter more fully into the distinction between the Siluroids of India and Burmah, as my collections of the fishes of this last district have not yet been thoroughly worked out and are in Europe.

Of the twenty-four Indian genera adverted to, we find some residents in waters of the plains, also in rivers on the hills with or without alpine sources.

Amongst the seventeen resident in waters of the plains and not extending their range into hilly regions we find in seven the air-vessel is free, viz. in *Rita*, *Hara*, *Pseudeutropius*, *Macrones*, *Callichrous*, *Wallago*, and *Pangasius*; whilst in ten it is more or less enclosed in bone, viz. *Ailia*, *Ailiichthys*, *Sisor*, *Bagarius*, *Saccobranchus*, *Silundia*, *Eutropiichthys*, *Gagata*, *Clarias*, and *Hemipimelodus*.

Amongst those residing in rivers of the plains and extending their range into those of the hills which have or are destitute of alpine sources, we perceive as follows:—

Of those four genera which are found in the waters of the plains as well as in hill-rivers with alpine sources, all have their air-vessels enclosed in bone, viz. *Amblyceps*, *Pseudecheneis*, *Exostoma*, and *Glyptosternum*; whilst the last three genera have representatives in the next division, and all are furnished with an adhesive apparatus.

Of the three genera found in rivers of the plains and also in those of hills destitute of alpine sources, none have their air-vessels enclosed in bone, viz. *Silurus*, *Olyra*, *Akysis*.

From the foregoing it appears that the majority of the genera of Indian freshwater Siluroids have their air-vessels enclosed in bone;

That no true Indian, wholly marine Siluroid has its air-vessel enclosed in bone;

That amongst the Siluroids of the hilly regions, those which ascend rivers having alpine sources have the air-vessel enclosed in bone;

That those which ascend rivers not snow-fed do not appear of necessity to have their air-vessels thus protected.

Space and time will not permit me to enter further on this subject at present, which, however, I hope to do at no very distant date.

2. On a small Collection of Butterflies from Angola.

By A. G. Butler, F.L.S., F.Z.S., &c.

[Received November 8, 1871.]

The present collection, though it only contains twenty-four species, of which three are new to science, is interesting as an addition to our knowledge of the Butterflies of Angola; it was made at Loanda, the capital of the Portuguese settlements in Angola, situated at 1000 feet elevation, at between 8° and 9° S. lat. Fourteen of the species in the following list were also in my list of the Diurnal Lepidoptera taken by Mr. Ansell at Kinsembo. This collection has been lent to me for determination by my friend and brother lepidopterist R. Meldola, Esq.

Family NYMPHALIDÆ.

Subfamily DANAINÆ, Bates.

Genus DANAIS, Latreille.

1. DANAIS CHRYSIPPUS.

Papilio chrysippus, Linnæus, Syst. Nat. ii. p. 767 (1766).

2. DANAIS LEONORA.

Danais leonora, Butler, P. Z. S. p. 51. n. 35 (1862); Lep. Exot. vii. p. 53. n. 1, pl. 20. fig. 2 (1871).

The sides of the abdomen in *D. leonora* are deep orange, as in the genus *Godartia*.

Subfamily SATYRINÆ, Bates.

Genus MYCALESIS, Hübner.

1. MYCALESIS CAFFRA.

Mycalesis caffra, Wallengren, Lep. Rhop. Caffr. p. 34. n. 2 (1857).

Subfamily NYMPHALINÆ, Bates.

Genus NEPTIS, Fabricius.

1. NEPTIS AGATHA.

Papilio agatha, Cramer, Pap. Exot. iv. pl. 327. figs. A, B (1782).

2. NEPTIS NEMETES.

Neptis nemetes, Hewitson, Exot. Butt. iv. *Nept.* pl. 1. figs. 1, 2 (1868).

Genus JUNONIA, Hübner.

1. JUNONIA CREBRENE.

Junonia crebrene, Butler (*cebrene*, Trimen), Trans. Ent. Soc. London, p. 524. n. 9 (1870*).

2. JUNONIA CLELIA.

Papilio clelia, Cramer, Pap. Exot. i. pl. 21. figs. E, F (1775).

3. JUNONIA CLOANTHA.

Papilio cloantha, Cramer, Pap. Exot. iv. pl. 338. figs. A, B (1782).

Genus EURYTELA, Boisduval.

1. EURYTELA DRYOPE.

Papilio dryope, Cramer, Pap. Exot. i. pl. 78. figs. E, F (1779).

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* My paper describing this species was read on the 4th July, and before the arrival of Mr. Trimen's paper in this country; it was also published in the same part of the Transactions with his. Were it possible I would gladly cede the right to the species; but as it is not so, I am compelled to quote it as above.

Genus ROMALEOSOMA, Blanchard.

1. ROMALEOSOMA CERES.

Papilio ceres, Fabricius, Syst. Ent. p. 504. n. 257 (1775).

One specimen of the variety figured in Lep. Exot. pl. 31. fig. 1 (Oct. 1, 1871), but slightly duller in colouring.

2. ROMALEOSOMA MEDON.

Papilio medon, Linnæus, Syst. Nat. i. 2, p. 753. n. 43 (1766).

Genus EURYPHENE (Boisd.), Westwood.

1. EURYPHENE MARDANIA.

♀. *Papilio mardania,* Fabricius, Ent. Syst. iii. p. 249. n. 776 (1793).

♂. *Papilio cocalia,* Fabricius, Ent. Syst. iii. p. 250. n. 777 (1793).

Two males only. This species is rare in collections.

Genus ATERICA, Boisduval.

1. ATERICA RIBENSIS?

Euryphene ribensis, Ward in Ent. Mo. Mag. p. 35 (1871).

It is impossible to be certain of the identity of this species with that characterized by Mr. Ward, in consequence of the extremely meagre description given by him; it, however, agrees very fairly with it as far as it goes.

Subfamily ACRÆINÆ, Bates.

Genus ACRÆA, Fabricius.

1. ACRÆA SERENA.

Papilio serena, Fabricius, Syst. Ent. p. 461. n. 76 (1775).

2. ACRÆA EPONINA.

Papilio eponina, Cramer, Pap. Exot. iii. pl. 268. figs. C, D (1782).

Family LYCÆNIDÆ, Stephens.

Subfamily LYCÆNINÆ, Butler.

Genus LAMPIDES, Hübner.

1. LAMPIDES BŒTICUS.

Papilio bœticus, Linnæus, Syst. Nat. ii. p. 789 (1766).

2. LAMPIDES HINTZA?

Lycæna hintza, Trimen, Rhop. Afr. Austr. ii. p. 243. n. 144 (1866).

I believe I have correctly identified this Butterfly; but the species are so nearly allied in this genus, their number so great, and their markings so complicated, that it is impossible, in most cases, without the assistance of figures or types, to be certain of the identification of a species, even though characterized by so careful a describer as the author of 'Rhopalocera Africæ Australis.'

Family PAPILIONIDÆ (Doubl.), Bates.

Subfamily PIERINÆ, Bates.

Genus TERIAS, Swainson.

1. TERIAS SENEGALENSIS.

Terias senegalensis, Boisduval, Sp. Gén. Lép. i. p. 672 (1836).

2. TERIAS PULCHELLA.

Xanthidia pulchella, Boisduval, Faune de Madag. p. 20, pl. 2. fig. 7.

Genus TERACOLUS, Swainson.

1. TERACOLUS LOANDICUS, sp. n.

♂. *Alæ supra albæ, apice late aurantiaco, fusco cincto, extrorsum sinuato; area basali cinereo rorata: posticæ punctis sex decrescentibus marginalibus venas terminantibus; corpus nigrum, griseo-hirtum.*

Alæ subtus albæ; anticæ area apicali flava, plaga subapicali diffuse aurantiaca: posticæ roseo tinctæ fusco roratæ, stria discali interrupta sqamosa fusca; puncto discocellulari nigro, introrsum fulvo cincto: exp. alar. unc. 1, *lin.* 6–8.

♀. *Alæ supra albæ; anticæ puncto discocellulari nigro; area apicali late aurantiaca; fascia lata subapicali subangulata, venis apicalibus et margine lato externo, nigris; area basali-interna cinereo-squamosa: posticæ margine externo angulis alternis dentato nigro; puncto costali et nebula centrali discali squamosis nigris; area basali cinereo-squamosa.*

Alæ subtus, anticæ albæ, area apicali ochracea, fascia lata diffusa puncta grisea includente aurantiaca; costa flavida, puncto discocellulari nigro: posticæ ochraceæ costa basali aurantiaca, aliter velut in mare: exp. alar unc. 1, *lin.* 6.

2. TERACOLUS INTERRUPTUS, sp. n.

♂. *Alæ supra albæ, area apicali aurantiaca, a stria media valde indistincta interrupta, hac maculam distinctam in nervulo secundo mediano formante; venis apicalibus extrorsum nigrescentibus et margine profundius dentato-sinuato; area basali ochraceo tincta: posticæ maculis marginalibus fasciam angulis alternis formantibus; area interno-basali ochraceo tincta; aliter velut in specie præcedente: exp. alar. unc.* 1, *lin.* 7.

♀. *Similis speciei præcedenti, differt area apicali anticarum dilutius aurantiaca; fascia subapicali tenuiore, introrsum sinuata; area* *basali ochraceo tincta: posticæ nebula discali obsoleta; area basali ochraceo tincta: exp. alar. unc. 1, lin. 6.*

Two examples of the male of this species were in the collection sent by Mr. Ansell from Kinsembo, a list of the species of which appeared in the Transactions of the Entomological Society for 1870 (see Tr. Ent. Soc. p. 527. n. 9).

Genus BELENOIS, Hübner.

1. BELENOIS MELDOLÆ, sp. n.

Affinis B. thysæ, *minor; anticæ margine externo duplo angustiore et inter venas interrupto; punctis discalibus obsoletis; posticæ margine haud maculato.*

Alæ anticæ subtus haud nigro maculatæ; area basali rufescente: posticæ puncto minuto costali, altero valde indistincto subapicali, tertio indistincto inter nervulos secundum et tertium medianos et quarto vix distinguendo inter nervulos primum et secundum, submarginalibus squamosis nigris, aliter haud nigro maculatæ: exp. alar. unc. 2, lin. 2.

Allied to *B. thysa*, Hopffer (*Papilio sabrata*, Doubleday), but quite distinct.

2. BELENOIS SEVERINA.

Papilio severina, Cramer, Pap. Exot. iv. pl. 338. figs. G, H (1782).

A number of specimens of this species came also in Mr. Ansell's collection.

Genus HERPÆNIA, Butler.

1. HERPÆNIA TRITOGENIA.

Pieris tritogenia, Klug & Ehrenberg, Symb. Phys. Ins. ii. pl. 8. figs. 17, 18.

3. Description of a new Genus of Lepidoptera allied to *Apatura*. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Received November 8, 1871.]

Whilst verifying the *Apaturæ* in the collection of the British Museum, my attention was arrested by an extraordinary development of the anal appendages in one of the species. This led me to examine with care the rest of the Butterflies referred to this genus; and as I found that none of them exhibited the same peculiarities of structure, I came to the conclusion that it must be separated as a distinct genus. Further comparison has revealed differences in the antennæ and neuration, which, taken together with peculiarities of coloration and in the outline of the wings, will obviate that difficulty of determining the genus which is so much to be deplored in such genera as *Appias* and *Belenois* of the *Pierinæ*, in consequence of the fact that their structural distinctions are confined to the male sex.

At page 395 of the 'Genera of Diurnal Lepidoptera,' in a footnote, Prof. Westwood characterized the typical species of this new genus under the name of *Apatura osteria*, the type being in the collection of the British Museum; as it was at that time the only example we possessed, and was destitute of an abdomen, no notice was taken in the diagnosis of the form of its anal valves; and consequently the species has remained without molestation in the genus *Apatura* up to the present time.

In the year 1868 a pair of *A. osteria*, in fair condition, were presented to the Museum by R. B. Were, Esq., who took them in India; in 1869 a male in good order was obtained from a collection made in Sarawak by Mr. Lowe; and last year Lieut. Henry Roberts presented a fine pair taken by himself at Singapore.

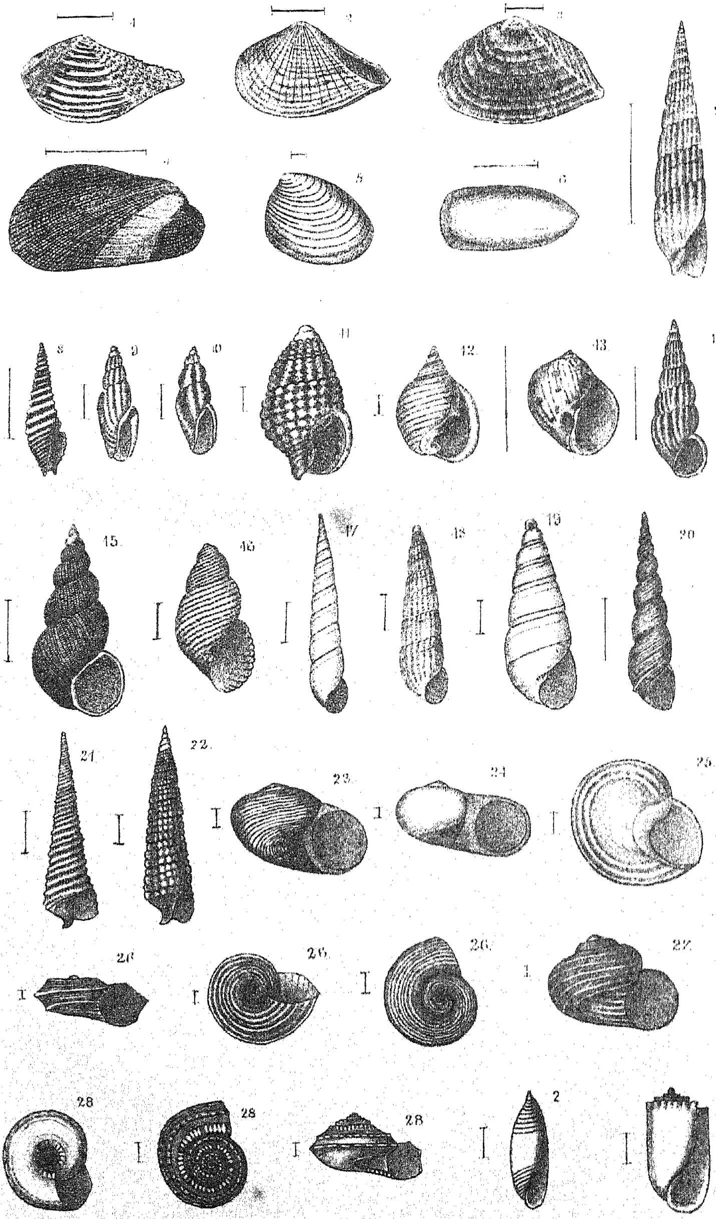
The female of *A. osteria* is of an olive-brown colour above, the primaries with a macular angulated white band, which becomes obscured by olive-brown in the secondaries; the discal area beyond this band is semihyaline and whitish in the primaries, and is followed by two obliquely placed subapical white spots and a submarginal series of whitish lunules; there is also a white-zoned blind ocellus between the first and second median branches; the discal area of the secondaries is ochreous brown, crossed by a darker brown macular bar, and followed by a series of broad white-zoned brown spots, bounded externally by brown, the margin pale brown; a black blind ocellus between the first and second median branches. In the shape of the wings and the colouring of the male this Butterfly reminds one of the smaller African species of the genus *Charaxes*; the hind wings, however, possess no trace of the tails so common in that genus.

EULACEÜRA, gen. nov.

Nearly allied to *Apatura*, but differing in its comparatively longer and more graceful anterior, and its shorter and more rounded posterior wings; antennæ longer, more slender, the club somewhat compressed laterally; median nervure of posterior wings longer, and consequently second and third median branches shorter.

Abdomen of male with anal valves composed of an upper hood-like lip, fringed externally with short hair-scales, and sheathing the penis, which is shorter and more spine-shaped than in *Apatura*, and projects obliquely downwards between two bispinose lateral walls of horny texture, and in shape resembling the open beak of a bird; the lower lip is formed by the union of two closely fitting horny sheaths, deeply excavated within, and terminating abruptly in two strong, perpendicular, somewhat curved, tapering, horny hooks, about a line and a half in length.

Typical species *Eulaceüra osteria*, Westwood.



Edgar Smith, lith.

Mintern Bros imp.

New Shells from West Africa.

4. A List of Species of Shells from West Africa, with Descriptions of those hitherto undescribed. By EDGAR A. SMITH, Zoological Department, British Museum.

[Received November 13, 1871.]

(Plate LXXV.)

The British Museum has lately received (1870) a series of shells from the Slave Coast, West Africa. They were all collected by the late Capt. Knocker, R.N., the majority of them being dredged at Whydah, on the Dahomey shore. As the knowledge of precise localities is always of value to the zoologist, in furtherance of a knowledge of geographical distribution, I thought it would be useful to publish the following list, at the same time adding descriptions of those species which appear to be new to science.

CONCHIFERA.

1. VENUS DECLIVIS, Sow. jun., Thesaur. Conch. ii. p. 730, pl. 157. f. 123, 124.

Hab. West Africa.

Mr. Sowerby gives "Eastern Seas" as the locality of this species.

2. VENUS CASINA, Linn. Syst. Nat. p. 1130.

Hab. Whydah.

This well-known European species has not been before recorded from West Africa. Mr. R. M'Andrew found it at the Madeira Islands.

3. DIONE FLORIDELLA, Gray, Analyst, viii. p. 306.

Hab. Whydah.

4. DIONE VIRGO, Gray, Cat. Cyth. Anal. viii. p. 306.

Hab. Whydah.

This species is also found at Java (*Cuming*). Capt. Knocker collected a variety, which is of a broader and more depressed form than typical specimens.

5. DIONE TELLINÆFORMIS, Phil. Abbild. Conch. iii. p. 59, pl. 9. f. 1.

Hab. Whydah.

6. TRIGONA TRIPLA, Linn. Mantissa, p. 545.

Hab. West coast of Africa.

7. TELLINA (MACOMA) UMBONELLA, Lamk. Anim. s. Vert. ed. 2, vi. p. 606.

Hab. Whydah.

This species is also found at Port Lincoln, South Australia (Angas, P. Z. S. 1865, p. 647).

8. **Donax rugosus**, Linn. Syst. Nat. (12th ed.) p. 1127.

Hab. Whydah.

9. **Donax (Capsella) owenii**, Gray, MS. in Brit. Mus.; Hanley, Cat. Rec. Shells, p. 81.

Hab. Whydah.

10. **Mactra (Trigonella) adansoni**, Phil. Zeitsch. für Malac. 1848, p. 152.

Hab. Whydah.

11. **Mactra (Schizodesma) nitida**, Schröter, Einl. Conch. iii. pl. 8. f. 2.

Hab. Whydah.

12. **Chama senegalensis**, Reeve, Conch. Icon. iv. sp. 5.

Hab. Whydah.

13. **Leda rostrata**, Mont. Test. Brit. Suppl. p. 55, pl. 27. f. 7.

Hab. Whydah.

14. **Leda tuberculata**, sp. nov. (Plate LXXV. fig. 1.)

Testa inæquilateralis, oblonga, postice modice rostrata, griseo-alba; antice plicæ 3 ad 4 oblique longitudinales, striis transversis confertim decussatæ; postice vel rostro tubercularum parvarum series 5 ad 6 obliquæ umbone radiantes; regione centrali costæ 16 concentricæ, crassæ; versus umbonem et marginem ventralem densissimæ; interstitia exilius striata.

Diam. transversa 8 mill., diam. longit. 4.

Hab. Whydah.

15. **Leda**, sp.? jun.

Hab. Whydah.

A small, very strongly, obliquely ribbed species, but too young to satisfactorily determine.

16. **Solen (Cultellus) tenuis**, Gray, ? MS. in Brit. Mus.

Hab. Whydah.

17. **Corbula modesta**, Hinds, P. Z. S. 1843, p. 57.

Hab. Whydah.

This species is described by Hinds as coming from Macassar and the Philippine Islands.

18. **Corbula striata**, sp. nov. (Plate LXXV. fig. 3.)

Testa parva, æquilateralis, paululum rostrata, albida cum macula triangulari rosea ornata; transversim crasse costata; striæ longitudinales exilissimæ creberrimæ supra et inter costas radiantes.

Diam. transversa 6 mill., diam. longit. 3½.

Var. *Omnino rufo-fusca.*
Hab. Whydah.

19. Corbula lirata, sp. nov. (Plate LXXV. fig. 2.)

Testa pyriformis, modice rostrata, sordido-alba, transversim costata; costæ versus marginem ventralem crassiores; carina obliqua in utraque valva ab umbone ad rostri apicem decurrens; de umbonibus costulæ filiformes paululum remotæ ad basim radiantes; valva dextra minor quam sinistra.

Diam. transversa 8 mill., diam. longit. 5.
Hab. Whydah.

The thread-like costulæ (about 24 in number) which radiate from the umbones are very remarkable.

20. Crassatella, sp. jun.

Hab. Whydah.

21. Actinobolus ajar, Brug. Enc. Méth. *Vers*, vol. i. part 2, p. 406.

Hab. Whydah.

22. Crenella (Modiolaria) multistriata, sp. nov. (Plate LXXV. fig. 4.)

Testa æquivalvis, inæquilateralis, flavo-castanea, transversim striata; antice et postice striis crebris decussata; striæ posteriores valvæ dimidium occupantes; interstitium non decussatum, parvum.

Diam. transversa 15 mill., diam. longit. 7.
Hab. Whydah.

One specimen is imbedded in a nidus (formed of pieces of shells, pebbles, &c.) within the valve of a *Pecten.*

23. Anomalocardia striata, Reeve, Conch. Icon. ii. sp. 121.

Hab. Whydah. "——?" (*Reeve*).

24. Anomalocardia, sp.

Hab. Whydah.

There are twelve equal-sized specimens of this species; but the small dimensions (5 mill. lata, 3 alt.) and general appearance of young examples make me hesitate in describing them.

They are oblong, rhomboidal, with the surface very finely decussated.

25. Scapharca pertusa?, Reeve, Conch. Icon. ii. sp. 28.

Hab. Whydah.

26. Axinea spadicea, Reeve, Conch. Icon. i. sp. 47.

Hab. Whydah.

The locality for this species was hitherto unrecorded.

27. Nucula crassicostata, sp. nov. (Plate LXXV. fig. 5.)

Testa parva, transversa, oblique subovalis; albida, versus umbones *fusco tincta, nitens; valvæ concentrice fortiter costatæ; valvarum margines inter crenulatæ.*

Diam. transversa 2 mill., diam. longit. 1½.

Hab. Whydah.

A very strongly ribbed species, one of the smallest of the genus, and the first recorded from West Africa, I believe.

28. Pecten pseudamusium, Klein, Meth. Ost. p. 134, pl. 9. f. 31.

Hab. Whydah.

29. Ostrea guineensis, Dkr. Novit. Conchol. Suppl. ii. p. 43, pl. 7. figs. 12–18.

Hab. Whydah.

This species was discovered by Dr. Tams at Loanda, about 1400 miles south of Whydah.

Brachiopoda.

30. Lingula parva, sp. nov. (Plate LXXV. fig. 6.)

Testa oblongo-ovalis, versus apicem parum attenuata, pallido flavida, lævis; valvæ clausæ.

Diam. transversa 5 mill., diam. longit. 10.

Hab. Whydah.

Pteropoda.

31. Balantium recurvum, Children, Journ. of Sci. Lit. & Arts, 1824.

Hab. Whydah.

Gasteropoda.

32. Terebra festiva, Desh. Journ. de Conch. vi. p. 74, pl. 3. f. 4.

Hab. West Africa.

33. Terebra (Myurella) marginata, Desh. Journ. de Conch. vi. p. 86, pl. 4. f. 8.

Hab. Whydah.

34. Terebra (Myurella) sowerbyana, Desh. Journ. de Conch. vi. p. 93, pl. 3. f. 8.

Hab. Whydah.

35. Terebra (Abretia) knockeri, sp. nov. (Plate LXXV. fig. 7.)

Testa elongato-subulata, pallide brunnea; infra suturam zona alba et ad peripheriam angustiore ornata; apex fuscus; anfractus 14, primi 4 convexi, politi, cæteri plane convexi, longitudinaliter costati, in anfractu ultimo costæ 16; apertura parva, angusta; columella fusco tincta, modice contorta.

Long. 20 mill., diam. 4.

Hab. Whydah.

36. TEREBRA MICANS, Hinds, Proc. Zool. Soc. 1843, p. 157.

Hab. West Africa.

37. PLEUROTOMA SPIRALIS, sp. nov. (Plate LXXV. fig. 8.)

Testa fusiformis, pallido-fusca; anfract. 18, *primi* 3 *politi, convexi, cæteri plane convexi, carina acuta in medio succincti; anfract. ultimus cingulis* 12 *æqualibus ornatus; sutura cingulo minore definita; interstitia oblique striata; apertura angusta; columella nigro-fusca; canalis brevissimus; labium tenue; incisura magna.*

Long. 11 mill., diam. 3.

Hab. Whydah.

This species belongs to the same group as *P. violacea*, Hinds.

38. DRILLIA PYRAMIDATA, Kiener, Icon. Coq. Viv. Monog. Pleurotoma, p. 57, pl. 21. f. 4.

Hab. Whydah.

39. DRILLIA (CRASSISPIRA) CARBONARIA, Reeve, Proc. Zool. Soc. 1843, p. 187.

Hab. West Africa. "——?" (*Reeve*).

40. PERRONA LINEATA, Lamk. Anim. s. Vert. ed. 2, vol. ix. p. 348.

Hab. Whydah.

41. CLATHURELLA LABIOSA, sp. nov. (Plate LXXV. fig. 9.)

Testa elongato-ovata, albida; anfract. 6, *infra suturam pellucide zonati, modice convexi, superne subangulati, oblique longitudinaliter valide costati, transversim sulcati; sulci supra costas indistincti; apertura angusta, elongata, spiram æquans, ad basim contracta; incisura distincta; labium crassissimum.*

Long. 5 mill., diam. 1½.

Hab. Whydah.

42. MANGELIA ANGULOSA, sp. nov. (Plate LXXV. fig. 10.)

Testa parva, ovata, pallido-brunnea; anfract. 6, *primi* 4 *convexi, politi, simplices, cæteri medio angulati, costis validis, curvatis, remotis (in anfract. ultimo* 6) *ornati; transversim exilissime striati; striæ supra costas indistinctæ; apertura subovata, spiram fere æquans; columella callosa, superne tuberculata; labium incrassatum; canalis perbrevis.*

Long. 5 mill., diam. 1¾.

Hab. Whydah.

43. MUREX TURBINATUS, Lamk. Anim. s. Vert. ed. 2, vol. ix. p. 586.

Hab. Whydah.

44. **Nassa tritoniformis**, Kiener, Coq. Viv. Buccinum, pl. 30. fig. 2, p. 108.

Hab. Whydah.

45. **Nassa pumilio**, sp. nov. (Plate LXXV. fig. 11.)

Testa minima, ovata, albido-cornea, nitida; anfract. 6, convexi; primi 3 politi, simplices, cæteri costis validis (in anfract. ultimo 12) ornati, costulis transversis (in anfract. tertio et quarto 4) decussati; apertura parva; columella callosa; labium incrassatum, intus denticulatum, extra rufo trimaculatum.

Long. 3½ mill., diam. fere 2.

Hab. Whydah.

A very pretty minute species, neatly cancellated, producing a noduled appearance, whitish, with a line beneath the suture and the lower part of the last whorl horn-colour.

46. **Nassa (Naytia) glabrata**, Sowerby, Thesaurus i. Monog. *Strombus*, p. 32, pl. 8. f. 66, 67.

Hab. Whydah. "?" (*Sowerby*).

47. **Cyllene owenii**, Gray, MS.; Sowerby, Thesaur. Conch. iii. p. 78, pl. 217. f. 19, 20.

Hab. Whydah.

48. **Purpura hæmastoma**, Linn. Syst. Nat. ed. 1, ii. p. 1202.

Hab. Lagos, West Africa.

49. **Pusionella milleti**, Petit, Journ. de Conch. ii. p. 76, pl. 1. f. 6.

Hab. Whydah.

50. **Oliva flammulata**, Lamk. Anim. s. Vert. ed. 2, vol. x. p. 613.

Hab. Whydah. "West Indies" (*Reeve*, Conch. Icon.).

51. **Oliva subulata**, Lamk. Anim. s. Vert. ed. 2, p. 626.

Var. *pallida*.

Entirely pinkish cream-coloured, with basal zone still paler.

Hab. Whydah.

52. **Oliva acuminata**, Lamk. Anim. s. Vert. ed. 2, vol. x. p. 625.

Hab. Whydah.

53. **Mitra hebes**, Reeve, Conch. Icon. ii. sp. 292.

Hab. Whydah. "——?" (*Reeve*).

54. **Marginella epigrus**, Reeve, Conch. Icon. xv. sp. 151.

Hab. Whydah.

This species was collected also by Mr. R. M'Andrew at Mogador, Morocco.

55. **Ringicula grandinosa**, Hinds, Proc. Zool. Soc. 1844, p. 96.

Hab. Whydah. "Philippines" (*Cuming*).

56. **Ringicula suturalis**, sp. nov. (Plate LXXV. fig. 12.)

Testa ovata, alba, polita; spira acuminata, sutura chorda callosa cincta; anfract. 5, convexi, spiraliter sulcati; in anfract. ult. sulci 10; apertura pyriformis; columella callosa triplicata; labrum extra valide incrassatum.

Long. 2¾ mill., diam. maj. fere 2.

Hab. Whydah.

This minute species belongs to the same striated group as *R. propinquans*, Hinds, from the Philippines and *R. someri*, De Folin, from the Cape-Verd Islands. Its much smaller size, the number and position of the teeth, and the callous chord around the suture of the whorls well distinguish it.

57. **Triton samier**, Adanson, Voy. Sénégal, p. 122, t. 8. f. 1.

Hab. West Africa.

58. **Natica collaria**, Lamk. Anim. s. Vert. ed. 2, vol. viii. p. 638.

Hab. West Africa, Whydah.

59. **Natica sagraina**, D'Orb. Moll. Cuba, pl. 18. f. 20–22.

Hab. Whydah.

I have compared the shells which I refer to this species with the typical specimen in D'Orbigny's collection of Cuban shells in the British Museum, and find that they are identical; therefore this species appears to be found in the Mediterranean (Malaga), *Reeve* (Con. Icon. ix. sp. 111), West Africa (Whydah), *Knocker*, and West Indies (Cuba), *D'Orbigny*.

60. **Natica marochiensis**, Lamk. Anim. s. Vert. ed. 2, vol. viii. p. 642.

Hab. Whydah. "Morocco and West Indies" (*Lamarck* and *Reeve*, Conch. Icon. ix.).

61. **Natica rubro-maculata**, sp. nov. (Plate LXXV. fig. 13.)

Testa globosa, lævis, umbilicata; spira breviuscula; anfract. 5, convexi, infra suturam leviter depressi et oblique sulcati, lineis longitudinalibus leviter undulatis et maculis subquadratis remotis aurantio-rubris (in anfr. ult. trifasciatim) ornati; columella recta.

Alt. maj. 15 mill., diam. maj. 15.

Hab. Whydah.

A very distinct solid species, longitudinally lined, and with three interrupted bands of squarish reddish spots encircling the last whorl; these bands are sometimes altogether absent, and sometimes there are but one or two.

62. Ianthina balteata, Reeve, Conch. Icon. xi. sp. 11.

Hab. North Atlantic?

63. Scala miranda, sp. nov. (Plate LXXV. fig. 15.)

Testa pyramidalis, imperforata, grisea; anfract. 8, perconvexi, varicibus obliquis numerosissimis tenuissimis (in anfract. ultimo 45) ornati; spiraliter minute sed distincte striati; apertura subcircularis.

Long. 9 mill., diam. 4.

Hab. Whydah.

A very numerously and finely variced species, with very convex whorls.

64. Scala bairdii, sp. nov. (Plate LXXV. fig. 14.)

Testa elongata, subturrita, imperforata, albido-purpurascens; anfract. 9, subconvexi, costis crassis curvatis (in anfract. ultimo 14) *instructi, spiraliter minutissime costas inter et supra striati; apertura ovata.*

Long. 11 mill., diam. 3½.

Hab. Whydah.

This is very distinct from any species yet known. The ribs are produced on to the whorls above, giving the sutural line a neat wavy appearance. Named after my kind friend Dr. Baird.

65. Aclis carinata, sp. nov. (Plate LXXV. fig. 20.)

Testa elongata, sordide alba; anfract. 9, perconvexi, transverse tenuiter sulcati; ad peripheriam subacute carinata; apertura ovata, basi effusa.

Long. 10 mill., diam. 2½.

Hab. Whydah.

A very graceful shell, with neatly sulcated whorls. The keel at the periphery is very remarkable.

66. Monoptygma (Myonia) puncturata, sp. nov. (Plate LXXV. fig. 16.)

Testa parva, elongato-ovata, subpellucida, brunneo-albida; anfract. 4, *convexi, spiraliter valide punctato-sulcati; in anfract. ult. sulci* 17; *spira brevis, apice obtuso; apertura subovata, ⅓ longitudinis paulo superans, basi subeffusa, marginibus callo tenui junctis; columella obliqua tortuosa.*

Long. 5 mill., diam. 2.

Hab. Whydah.

The sculpture agrees with that of *M. amœna*, A. Ad. Proc. Zool. Soc. 1851, p. 223, from the Philippines; but the convexity and number of the whorls, the shortness of the spire, and the obtuse apex are sufficient characters by which it may readily be distinguished.

67. Obeliscus (Syrnola) gracillima, sp. nov. (Plate LXXV. fig. 17.)

Testa imperforata, gracilis, elongata, polita, alba; anfract. 11, *primi 2 (nucleus) globosi, cæteri plani, infra suturam fascia diaphana ornati; sutura valde distincta; apertura pyriformis; columella uniplicata.*

Long. 6½ mill., diam. 1¼.

Hab. Whydah.

A very slender species, of a pure white colour, with the upper part of the whorl girdled with a pellucid zone.

68. **Odostomia sulcifera**, sp. nov. (Plate LXXV. fig. 19.)

Testa parva, alba, polita; anfract. 6; primus tubercularis, cæteri subplani, indistincte longitudinaliter striati, infra suturam zona pellucida ornati, et infra medium sulco lineari cincti; apertura pyriformis; columella læviter dentata.

Long. 5 mill., diam. 2.

Hab. Whydah.

The apex is not acute, as in the Mediterranean *O. conoidea*, the spire is not so conical, and the columellar tooth is small.

69. **Turbonilla costifera**, sp. nov. (Plate LXXV. fig. 18.)

Testa imperforata, elongata, pallido-fulva; anfract. 8, primi 2 (nucleus) perconvexi, cæteri planiusculi, longitudinaliter valide costati, inter costas striati, infra suturam fascia diaphana ornati; apertura subquadrata, parva; columella uniplicata.

Long. 5½ mill., diam. 1½.

Hab. Whydah.

70. **Eulima distorta**? (Desh.) Philippi, Moll. Sicil. i. p. 158, t. 9. f. 10.

Hab. Whydah. "Teneriffe" (*M'Andrew*).

Only differing from *distorta* in being nearly straight and a little broader.

71. **Leiostraca bivittata**, H. & A. Ad. Gen. Moll. i. p. 239.

Eulima bilineata, Ad. & Reeve, Voy. Samarang, p. 72, pl. 11. f. 24.

Hab. Whydah. "China Sea" (*Ad. & Reeve*). "Island of Negros, in coarse sand and gravel, 7 fms." (*Cuming*).

The shells referred to this species are generally smaller, a trifle broader, and the columella somewhat straighter and more thickened.

72. **Turritella candida**, Reeve, Conch. Icon. v. sp. 38.

Hab. West Africa. "——?" (*Reeve*).

73. **Turritella annulata**, Kiener, Coq. Viv. p. 20, pl. 13. f. 1.

Hab. West Africa.

74. PROTOMA KNOCKERI, Baird, Proc. Zool. Soc. 1870, p. 59.

Hab. Whydah.

This new genus and species is well figured at the above page.

75. TROCHITA CHINENSIS, Linn. Syst. Nat. p. 1257.

Hab. Whydah.

A well-known European species, extending to the Canaries and West Africa.

76. CERITHIUM (CERITHIOPSIS?) GEMMULIFERUM, sp. nov. (Plate LXXV. fig. 22.)

Testa parva, elongata, pallido-brunnea; anfract. 11, *primi* 3 *læves, perconvexi; cæteri subplani, triseriatim granulati; series infrasuturalis minima; apertura subquadrata; canalis brevis.*

Long. 4 mill., diam. 1.

Hab. Whydah.

This species at times probably attains a larger size.

77. CERITHIUM (CERITHIOPSIS?) CARINATUM, sp. nov. (Plate LXXV. fig. 21.)

Testa elongata, pallido-brunnea; anfract. 15, *primi* 3 *læves, convexi, cæteri plani, carinis tribus (infima maxima) cincti; interstitia longitudinaliter concinne striata; apertura subquadrata; canalis brevis.*

Long. 6 mill., diam. basi 1½.

Hab. Whydah.

78. TRIPHORIS GRANULATA, Ad. & Reeve, Voy. Samarang, p. 46, pl. 11. f. 33, *a*, *b*.

Hab. Whydah.

The shells referred to this Chinese species differ in one character from it; viz. the granules of the middle row are constantly smaller than those of the two adjacent ones, in this respect agreeing with *Triphoris fusca*, Dkr., from Japan.

79. SOLARIELLA CANALICULATA, sp. nov. (Plate LXXV. fig. 28.)

Testa parva, late umbilicata, margaritacea, pulcherrime prismatica; spira depresso-conica; anfract. 5, *primi* 2 *læves, cæteri spiraliter lirati et infra suturam canaliculatam tuberculorum albidarum (hic illic castaneo notatarum) serie ornati; anfract. ult. carinis duabus castaneo-punctatis et basi zona purpureo-brunnea cinctus; umbilicus perspectivus, chorda tuberculari marginatus; apertura subcircularis.*

Alt. 2 mill., diam. maj. 3.

Hab. Whydah.

A very pretty pearly species, with a channelled suture, and with a row of tubercles beneath it; about every seventh one is chestnut, the rest whitish. The umbilicus is girt with a somewhat tubercular chord and a zone of purplish brown.

80. CYCLOSTREMA TRICARINATA, sp. nov. (Plate LXXV. fig. 26.)

Testa parva, depressa, alba, late perspective umbilicata; anfract. 5, rapide augentes, spiraliter lirati; spira plana; sutura depressa; anfract. ult. acute tricarinatus; carina mediana maxima; apertura subhexagonalis; perist. carinis triangulatum, marginibus callo tenui junctis.

Alt. 1 mill., diam. maj. 3.

Hab. Whydah.

A prettily lirated, depressed species, with the body-whorl tricarinate, the centre keel being the largest.

81. CYCLOSTREMA ROSEOTINCTA, sp. nov. (Plate LXXV. fig. 27.)

Testa parva, pallido-rosea, valide umbilicata; anfract. 4, convexi, spiraliter leviter lirati, incrementi lineis subtiliter decussati; sutura depressa; apertura fere circularis; perist. continuum.

Alt. $1\frac{1}{2}$ mill., diam. maj. $1\frac{3}{4}$.

Hab. Whydah.

This species has somewhat the appearance of a non-pearly *Margarita*, and it is with doubt that I refer it to *Cyclostrema*.

82. ETHALIA LIRATA, sp. nov. (Plate LXXV. fig. 23.)

Testa parva, alba, subimperforata; anfract. $3\frac{1}{2}$, spiraliter tenue lirati, infra suturam et circa regionem umbilicalem radiatim valde plicati; apertura circularis; perist. continuum, crassum.

Alt. 2 mill., diam. maj. 3.

Hab. Whydah.

A somewhat globular species, finely lirate spirally, and beneath the suture and the umbilical callosity strongly plicate.

83. ETHALIA PLICATA, sp. nov. (Plate LXXV. fig. 24.)

Testa parva, alba, lævis; anfract. $3\frac{1}{2}$, rapide augentes; incrementi lineis subtilissime striati; spira depressa; sutura callosa, oblique sulcata; regio umbilicalis callositate plicata partim obtecta; apertura circularis; perist. solidum, marginibus callo crassissimo junctis.

Alt. $1\frac{1}{4}$ mill., diam. maj. $2\frac{1}{3}$.

Hab. Whydah.

A small, nearly smooth species, with a callous sulcate suture to the whorls, and also a callosity nearly concealing the umbilicus; in many respects agreeing with the genus *Leucorhynchia* of Crosse.

84. TEINOSTOMA SOLIDA, sp. nov. (Plate LXXV. fig. 25.)

Testa solida, parva, pallido-fulva, lævis; anfract. 4, rapide augentes, ultimus superne lævis, basi planiusculus, spiraliter trisulcatus; regio umbilicalis callosa; apertura depresso-rotundata; perist. basi recedens.

Alt. 2 mill., diam. maj. $3\frac{1}{3}$.

Hab. Whydah.

A depressed species, plain above and trisulcate beneath.

85. Dentalium inversum, Desh. Anim. s. Vert. ed. 2, vol. v. p. 599.

Hab. Whydah. West Indies (*Cuming coll.*).

86. Fissurella obtusa, Sowb. Conchol. Illust. fig. 59. no. 64. = ? *F. mutabilis*, Sowb. P. Z. S. 1834, p. 127.

Hab. Whydah. Cape of Good Hope (*Reeve*, Conch. Icon.).

87. Patella plumbea, Lam. Anim. s. Vert. ed. 2, vol. vii. p. 530.

Hab. Lagos, West Africa.

88. Cylichna cylindracea, Pennant, Br. Zool. iv. p. 117, t. 70. f. 85.

Hab. Whydah.

This species is very widely distributed, being found at Shetland (*Jeffreys*), Madeira and Canaries (*M'Andrew*), Whydah (*Knocker*). The latter is the most southern locality yet known.

89. Scaphander scaber, Müll. Zool. Dan. ii. p. 41, pl. 71. f. 10–12.

Hab. Whydah.

The only difference I can detect in the present specimen is that it is a trifle narrower than typical specimens of *S. scaber*. The remark affixed to the preceding species applies to this also.

90. Tornatina knockeri, sp. nov. (Plate LXXV. fig. 30.)

Testa cylindrica, albida; spira turrita, perbrevis; apex tubercularis; anfract. 5, ultimus politus, lævis, superne angulatus et plicatus; apertura anfrac. ultimum subæquans; labium rectum; columella uniplicata.

Long. 4½ mill., diam. 2.

Hab. Whydah.

Easily known by its flattish spire, tubercular apex, and the plications at the upper part of the body-whorl.

91. Volvula cylindrica, sp. nov. (Plate LXXV. fig. 29.)

Testa minuta, elongato-ovata, superne rostrata, polita, alba, antice et postice transversim striata, medio lævis; apertura superne angusta, inferne dilatata; columella crassa.

Long. 5 mill., diam. 3.

Hab. Whydah.

Peculiar for the beaked apex and the (about 12) spiral striæ at the upper and lower portions.

92. Siphonaria venosa, Reeve, Conch. Icon. ix. sp. 12.

Hab. Whydah. "Cape" (*Reeve*).

DESCRIPTION OF PLATE LXXV.

Fig. 1. *Leda tuberculata*, p. 728.
2. *Corbula lirata*, p. 729.
3. —— *striata*, p. 728.
4. *Crenella* (*Modiolaria*) *multistriata*, p. 729.
5. *Nucula crassicostata*, p. 729.
6. *Lingula parva*, p. 730.
7. *Terebra* (*Abretia*) *knockeri*, p. 730.
8. *Pleurotoma spiralis*, p. 731.
9. *Clathurella labiosa*, p. 731.
10. *Mangelia angulosa*, p. 731.
11. *Nassa pumilio*, p. 732.
12. *Ringicula suturalis*, p. 733.
13. *Natica rubro-maculata*, p. 733.
14. *Scala bairdii*, p. 734.
15. —— *miranda*, p. 734.
16. *Monoptygma* (*Myonia*) *puncturata*, p. 734.
17. *Obeliscus* (*Syrnola*) *gracillima*, p. 734.
18. *Turbonilla costifera*, p. 735.
19. *Odostomia sulcifera*, p. 735.
20. *Aclis carinata*, p. 734.
21. *Cerithium* (*Cerithiopsis?*) *carinatum*, p. 736.
22. —— (*Cerithiopsis?*) *gemmuliferum*, p. 736.
23. *Ethalia lirata*, p. 737.
24. —— *plicata*, p. 737.
25. *Teinostoma solida*, p. 737.
26. *Cyclostrema tricarinata*, p. 737.
27. —— *roseotincta*, p. 737.
28. *Solariella canaliculata*, p. 736.
29. *Volvula cylindrica*, p. 738.
30. *Tornatina knockeri*, p. 738.

5. On the Asymmetry of the Skull in *Strix tengmalmi*. By Robert Collett, Member of the Scientific Society of Christiania. (Communicated by Prof. Newton, M.A., F.R.S., V.P.)

[Received June, 1871.]

In all the *Strigidæ* the 'os squamosum' forms posteriorly a sharp, projecting, and vertical 'crista,' having its greatest width almost exactly behind the 'fossa glenoidalis,' which, with a more or less distinct incision, bends downwards and half forwards in front of the ear-openings, thus serving without doubt to strengthen the organ of hearing in this Family.

In the greater number of North-European species (for example, *Strix nyctea*, *S. passerina*, *S. bubo*, *S. aluco*, and *S. flammea*) this 'crista' appears at the top like a round nail, the upper edge of which is separated by a distinct inflexion from the uppermost part of the bone, and proceeds downwards by a rather sharp incision in the lateral parts of the 'os occipitale.' In *Strix brachyotus* and *S. otus*, on the contrary, this 'crista' appears to be insensibly and without any inflexion joined with the uppermost part of the bone, and con-

Fig. 1.

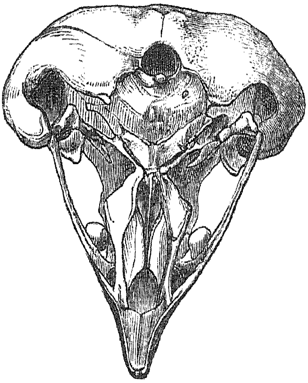


Fig. 2.

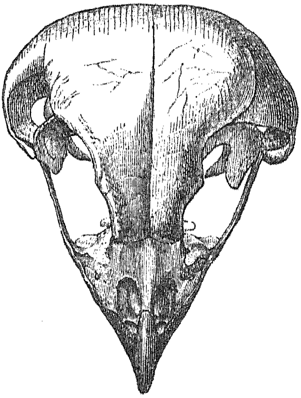


Fig. 3.

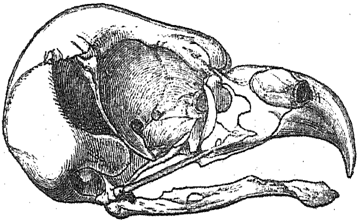


Fig. 4.

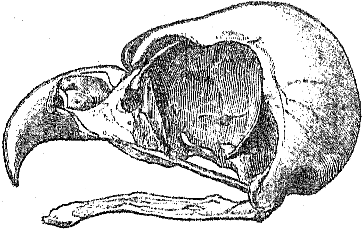


Fig. 5.

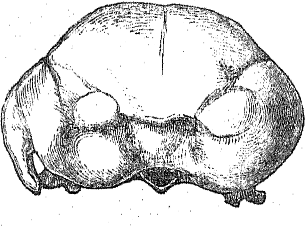
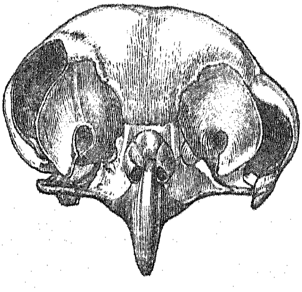


Fig. 6.



Skull of *Strix tengmalmi*, from different points of view, showing its asymmetry.

tinues without any incision of its margin down to the 'os occipitale.' From this cause there exists, in the two species last named, to a greater degree than in the others, a wall, open in front and closed behind, projecting to the sides. When the skulls are seen in front the 'cristæ' appear in these two species very distinctly, while in the rest they are almost completely hidden behind the 'processus orbitalis posterior.' I have not had an opportunity of examining the other species of the northern fauna not named here (*Strix funerea*, *S. liturata*, *S. lapponica* and *S. psilodactyla*); but I have seen several non-European species.

The wall just mentioned is peculiarly adapted to throw back the vibrations of sound and carry them on to the 'membrana tympani' in all the species which I have examined. I am therefore inclined to attribute to the nearly allied *Strix otus* and *S. brachyotus* a highly developed power of hearing. In a still greater degree, however, is this the case in *S. tengmalmi*, where this bone, and by consequence several of those adjoining it, has a very peculiar formation.

In *Strix tengmalmi* the 'crista' which the 'os squamosum' pushes forth in front of the ear-opening projects more considerably than in the other species; and as the outer edge of the 'crista' widens about the middle into a long tongue-shaped process, the whole 'os squamosum' surrounds a larger and deeper ear-cavity than in any of the other species with which I am acquainted.

But at the same time a very remarkable asymmetry appears in this 'crista.' On the *right* side (see figs. 2, 3, & 6, p. 740) it projects far upward and behind the upper edge of the 'os alisphenoideum;' and on the *left* side (see figs. 2, 4, & 6, p. 740), on the contrary, it leans immediately on the foremost edge of that bone and somewhat beneath its upper part. On both sides it normally joins in its lower part the 'os occipitale laterale' extending on the *right* considerably more (its height being here 20 mm.) than on the *left*, where its height is only 15 mm. On the *right* side, where this 'crista' has its largest extent and at the same time is drawn furthest back, it apparently projects at the top behind the point where the projecting end of the 'os parietale' meets the upper edge of the 'os squamosum.' Between where the 'crista' begins and the foremost edge of the remaining part of the 'os squamosum' (that point at which the last-mentioned bone touches the hinder edge of the 'os alisphenoideum') there is a proportionately considerable distance, amounting in four of the skulls examined by me to 7·25 mm. On the *left* side, on the contrary, the 'crista' projects at the top immediately at the point which the 'os squamosum' forms with the 'parietale,' 'frontale,' and the hinder edge of the 'alisphenoideum.' Here the 'crista' leans upon the upper (but not the uppermost) end of the 'processus orbitalis posterior.' Though this 'crista' at its upper end joins the 'os squamosum' very differently on either side, its lower part is apparently symmetrical and proceeds normally on both sides to the lateral parts of the perfectly symmetrical 'occipitale.'

In most of the Northern *Strigidæ* the outer edge of the 'crista' has a distinct incision, bending downwards to the 'os occipitale' below the middle. In *Strix otus* and *S. brachyotus*, however, it is almost entire and without any incision. But in *S. tengmalmi* there appears the peculiar extension, already mentioned, which reaches in front of the ear-openings and bends downwards and finally inwards.

This process in the 'crista' proves to be only asymmetrical in appearance, extending on the one side (where it is itself shorter than on the other) far more downwards than on the opposite side. On close examination it will be found that this process projects on both sides to an equal distance from the upper end of the 'crista;' and having the same length and curvature on each side, it consequently terminates higher up on the *right* side (where, as has been said, the 'crista' is longer) than on the *left* (where the 'crista' is shorter). The apparent asymmetry of this process is therefore not due to its own structure, but to the 'crista' itself.

While this extension of the *right* prolonged 'crista' bends forwards, downwards, and finally inwards, *above* the 'os jugulare,' and touches with its rounded extremity the lowest and outer edge of the 'processus orbitalis posterior,' it bends on the *left* side (which is shortened) *beneath* the 'os jugulare' and widens at its extremity into an oblong 'condylus,' which fits into and articulates (sometimes feebly but yet plainly) with a corresponding surface on the 'os coronoideum maxillæ inferioris,' jointly with the normal 'os quadratum' and 'os jugulare.' The 'cranium' in this way comes into immediate contact with the lower jaw (as seen in fig. 4, p. 740).

As to the other parts of the 'os squamosum,' it may be said that the 'processus zygomaticus' is but very feebly developed. The 'processus orbitalis posterior' seems in this species (as appears also to be the case in young examples of *Strix aluco*) to be formed solely of the 'os alisphenoideum;' but, as in all the *Strigidæ*, it is very strongly developed, forming a considerable part of the outer side-wall of the orbit, and bending down, like a flattened sharp-ending nail, before the 'os squamosum,' without (as is the case in *S. flammea*) reaching the 'os jugulare.'

The precise nature and extent of any asymmetry in the other bones, coalescent with the 'os squamosum,' I am not at present able to point out. That there must be a modification in a slighter degree of the 'os alisphenoideum,' 'os frontale,' and 'os parietale' (especially of the last) is perfectly consequent, and it strikes the eye on a cursory examination of the skull. But for this purpose examples of younger individuals, which I have not yet obtained, are required. An examination of an immature example preserved in the Museum of the University of Christiania, the plumage of which is minutely described in the 'Nyt Magazin for Naturvidenskaberne' (xviii. p. 161), led to no result, the cranium (on account of its youth) being defective.

The observations above recorded are based on an examination of nearly a dozen skulls of *Strix tengmalmi*, all of which have proved to be alike even to the most minute particulars.

P.S.—Doubtless the nearly allied (if, indeed, specifically distinct)

North-American form, *Strix richardsoni*, will present a similar asymmetry. In the 'Proceedings of the Academy of Natural Sciences of Philadelphia' for 1870 (p. 73), Mr. Streets states that in the collection of the Academy there are two asymmetrical skulls of an Owl, which he supposes to be *S. acadica*; and these, from the short description, seem to show exactly the same asymmetry as *S. tengmalmi* does. It is possible that this remarkable feature is not peculiar to *S. tengmalmi* and its transatlantic relative, but that it may appear in all the species of the group *Nyctala*. However, until this is proved, there is reason to suspect that the skulls described by Mr. Streets as belonging to *S. acadica* are rather those of *S. richardsoni* *.

6. Notes on rare or little-known Animals now or lately living in the Society's Gardens. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.—Part III.† Reptiles.

[Received November 15, 1871.]

The concluding portion of my notes written during the preparation of the new edition of the 'List of Vertebrates' (which I hope to have ready very shortly) relates to the Testudinata, of which group we have of late years received a considerable number of specimens.

As regards the other Reptilia and the Batrachians, Dr. Günther has always had the kindness to name them for us; so that all doubtful specimens have been referred to his determination.

In the arrangement and nomenclature of the Testudinata in the new edition of the 'List of Vertebrates' I have followed very nearly the system adopted by Dr. Strauch in his "Chelonologische Studien," Mém. Ac. St. Pét. ser. 7, vol. v. (1862), and "Vertheilung der Schildkröten," *ibid.* vol. viii. (1865).

38. Testudo tabulata, Walbaum.

Duméril and Bibron ‡ make *Testudo carbonaria* of Spix a distinct species from this; and Dr. Strauch follows them in so doing. Dr. Gray, in his recent catalogue, throws the two species together. The examination of two Tortoises purchased for the Society's collection in February § last, which are since dead, leads me to believe that the former view is correct. As Duméril and Bibron observe, the two animals are unquestionably very nearly allied. But *Testudo carbonaria* is recognizable by its much more compressed shape, blacker general colour, and by the very different form of the head-shields. In *T. tabulata* the frontal or fronto-nasal shield is divided by a median line; in *T. carbonaria* it is entire. This at least is the case with our specimens, just as Duméril and Bibron have remarked.

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* [In justice to Herr Collett it should be observed that, with the exception of the concluding paragraph, the foregoing paper was in my hands early in June, at which time, I believe, the Philadelphia 'Proceedings' for 1870 had not reached Europe.—A. N.]

† See Part I. Mammals, *anteà*, p. 221, and Part II. Birds, *anteà*, p. 489.

‡ Erp. Gén. ii. p. 99.

§ Purchased Feb. 3, 1871.

Our two specimens of *Testudo carbonaria* (purchased February 19, 1869) were said to have been received from Surinam. They were entered in the register as *Testudo tabulata*. Of *T. tabulata vera* one example, purchased Dec. 16, 1870, was obtained on the island of Marajo, Lower Amazon. Mr. E. Bartlett has lent me others for comparison, one of which he obtained in Eastern Peru, where, he tells me, it is the only Land-Tortoise known to occur.

39. TESTUDO ARGENTINA, Sclater.

In my notes on the Tortoises in the Society's Gardens named *Testudo chilensis* by Dr. Gray, which were published in the 'Proceedings' for 1870 (p. 667)*, I showed the improbability of these animals being really natives of Chili, where, according to all the best authorities, no species of Testudinata are known to exist; and in some further remarks on the same subject in the 'Annals of Natural History'† I suggested the alternative name *Testudo argentina* for this species, in case my views should turn out to be correct. Dr. Philippi's letter on the question, stating that the so-called Chilian Tortoises had been obtained from the vicinity of Mendoza, has been already read to the Society ‡. Since then I have also made inquiries on the same subject of Mr. Weisshaupt, who himself brought the Tortoises in question to England, and has recently visited us again with a second collection of animals. Mr. Weisshaupt informs me that he procured these Tortoises himself during his expedition to Mendoza; so that there can be no longer any doubt on the subject §. Under these circumstances *Testudo argentina* will be the proper name for the species ‖.

40. TERRAPENE CARINATA (Linn.).

In the autumn of last year we received three living examples of this Tortoise from Massachusetts, U.S.A., and four from Mexico. All the Mexican specimens had but three claws on the hind feet, and belonged therefore to *Onychotria mexicana*, Gray (=*Cistudo triunguis*, Agassiz). Dr. Strauch, however, contends that this difference is not even specific (Verth. d. Schildkr. p. 45)—a point which I cannot consider yet quite decided.

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* In these notes, for *Testudo stellata* in three places read *Testudo sulcata*, as is obvious from the context.

† Ann. Nat. Hist. ser. 4, vol. vi. p. 471.

‡ See *anteà*, p. 480.

§ I may add that Mr. Weisshaupt expressly denied ever having given the information regarding these Tortoises quoted by Dr. Gray (Ann. Nat. Hist. Jan. 1871, p. 18). Moreover, as Santiago is not on the coast of Chili, but high in the Andes, and some sixty miles from the Pacific, the circumstances there stated are incorrect on the face of them.

‖ See the rules of the Stricklandian code of nomenclature.

41. CINOSTERNUM LEUCOSTOMUM.

In 1870 we received four living specimens of a species of *Cinosternum*, which I had little hesitation in referring to *C. leucostomum* of A. Duméril (Arch. d. Mus. vi. p. 239, pl. xvii.). Two of these were brought from Greytown, Nicaragua, by an officer of one of the Royal Mail Steam-ship Company's vessels, along with an example of *Clemmys ornata*. The other two were purchased out of a ship, with the information that they had come from the Laguna de Terminos, on the coast of Yucatan. Along with the latter were obtained likewise an example of *Clemmys ornata* and a specimen of a *Dermatemys abnormis**. I mention these particulars in order to extend our knowledge of the range of this species, of which M. Duméril's only certain localities are Guatemala (*Morelet*) and New Granada (*Lewy* and *Goudot*). I may add that some of these Tortoises were taken to the British Museum and identified with *Swanka maculata*, Gray †; so that I think it probable that that name is a synonym of *Cinosternum leucostomum*.

42. PODOCNEMIS UNIFILIS, Troschel.

On December 16th of last year we purchased for the Society's collection two small living Tortoises of the genus *Podocnemis*, of which I now exhibit the dried shells, and which I entered in the register of accessions as *Podocnemis expansa* and *P. unifilis* ‡. The officer of the steam-ship 'Augustine,' from whom they were obtained, informed me that the former was obtained on the Lower Amazon, and the latter from Purus on the Upper Amazon. In my report on the additions to the Menagerie for December 1870 § I stated in reference to *P. unifilis* that a similar specimen in the British Museum had been referred to the young of *P. dumeriliana*, but that I thought this could be "hardly correct." Dr. Gray, in a recent number of the 'Annals' (ser. 4, vol. viii. p. 68), has endeavoured to prove that this determination (*i. e.* that *P. unifilis* = *P. dumeriliana*, jr.) is correct, and has even come to the conclusion that the character of having only one beard on the lower mandible (whence Prof. Troschel derived his name *unifilis*) so far from being a peculiarity of this species is "common to all the species of the family Peltocephalidæ," *i. e.* to the genera *Podocnemis* and *Peltocephalus*, which, in Dr. Gray's latest arrangement, constitute his family Peltocephalidæ. But I cannot agree to this view. In the first place the *Podocnemis* received along with the specimen of *P. unifilis*, and which I entered as *P. expansa*, has (as you may see by the dried specimen now before you) a distinct double beard, which in the living animal was very prominent, and first called my attention to its specific difference from *P. unifilis*. Secondly, Wagler (Syst. d. Amph.

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* Described and figured by Dr. Gray, P. Z. S. 1870, p. 716, pl. xliii., as *Chloremys abnormis*.

† Suppl. Cat. Shield Rep. p. 68.

‡ See P. Z. S. 1870, Appendix, p. 910.

§ See *anteà*, p. 36.

pl. iv. fig. 2) most clearly figures a double beard in *P. expansa*. Thirdly, Duméril and Bibron (Erp. Gén. i. p. 584) give as a generic character of *Podocnemis* "*deux barbillons sous le menton*," and again speak of these (*ibid.* p. 385) in describing *P. expansa*. Fourthly, *Peltocephalus*, according to the best authorities, has no chin-beard at all. So that I do not think it can be truly said that the one-bearded chin is a character of the family Peltocephalidæ.

As regards the question whether *P. unifilis* in the stage described by Prof. Troschel (with which the specimen now before me agrees very exactly, except that the spots on the head are bright yellow, not white, the colour in Prof. Troschel's specimen having been probably destroyed in spirit) is a good species, I have not been able to come to a very satisfactory conclusion. We require more information concerning the history of the Amazonian Tortoises and their various stages before we can come to positive results on the subject. Dr. Peters some time ago informed me that he considered *P. unifilis* a good species, and had several specimens in the Berlin Museum; and I see that he has recently recorded the occurrence of a Tortoise on the Ucayali under this name*.

Mr. Edward Bartlett informs me that he believes that he met with four species of the genus *Podocnemis* during his Amazonian travels, namely:—

1. The *Tartaruga grande* or *Cherapa grande*, which is "common all over the Amazons, and grows to a length of 2 feet or more, and lays from 100 to 150 soft round eggs, generally in steep sand-banks." This is no doubt *Podocnemis expansa* (Schweigg.) (=*Emys amazonica*, Spix), Dum. et Bibr. ii. p. 585. There can be no question, I think, that this species always has two barbules under the chin. Spix, it is true, says of it "*gula unicirrhosa*;" but Wagler, who figures from Spix's specimen, as I have said above, gives *two*.

2. The *Cherapilla*, a smaller species, found on the Huallaga and Ucayali. "It grows to a length of not more than 18 inches, and lays from twenty to forty eggs in rather a deep hole on flat sand-banks." The eggs, of which I exhibit Mr. Bartlett's specimens, are oval, and their shells quite hard; they measure 1·8 in. by 1·35.

This I suppose to be *Podocnemis dumeriliana* (Schweigg.) or *Emys macrocephala* of Spix. Whether this species has one or two barbules on the throat I cannot quite decide. A fine dried specimen (measuring about 16 in. in length of the upper shell) which Mr. E. Bartlett has lent to me has certainly only *one* central barbule. But in the figure of the head of *P. dumeriliana* given by A. Duméril (Arch. d. Mus. vi. pl. xviii. fig. 3) two barbules are plainly shown.

Dr. Gray has pointed out the differences in the form of the ridges on the alveolar surface of the upper jaw which separate this species from *P. expansa*, and which are well shown in the four skulls now exhibited from Mr. E. Bartlett's collection. But Dr. Gray has not remarked on another still more characteristic point of difference in the skulls of the two species, to which Mr. Bartlett has called my attention. In *P. dmmeriliana* there is a large oval fossa (*af*, fig. 2), about two tenths of an inch in depth, immediately in front of the aperture (*ac.*) in which the columella is lodged. This fossa does not exist in the skull of *P. expansa* (fig. 1), or at least is only shown by a slight depression of the surface in the same spot. Moreover the large somewhat triangular-shaped fossa behind the aperture (*pf*), which occurs in both species, is very much larger in *P. dumeriliana* than in *P. expansa*.

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* Monatsb. Ac. Berl. Aug. 3, 1871.

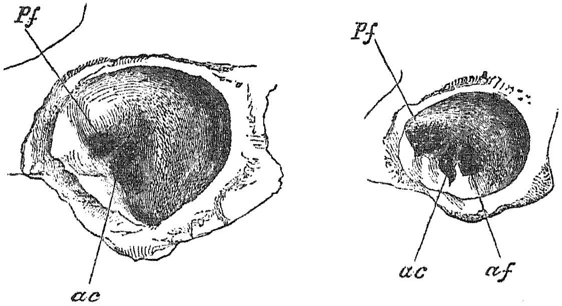


Fig. 1. Fig. 2.

Right tympanic rings of *Podocnemis expansa* (fig. 1) and *P. dumeriliana* (fig. 2). *pf.* Posterior fossa. *af.* Anterior fossa. *ac.* Aperture of the columella.

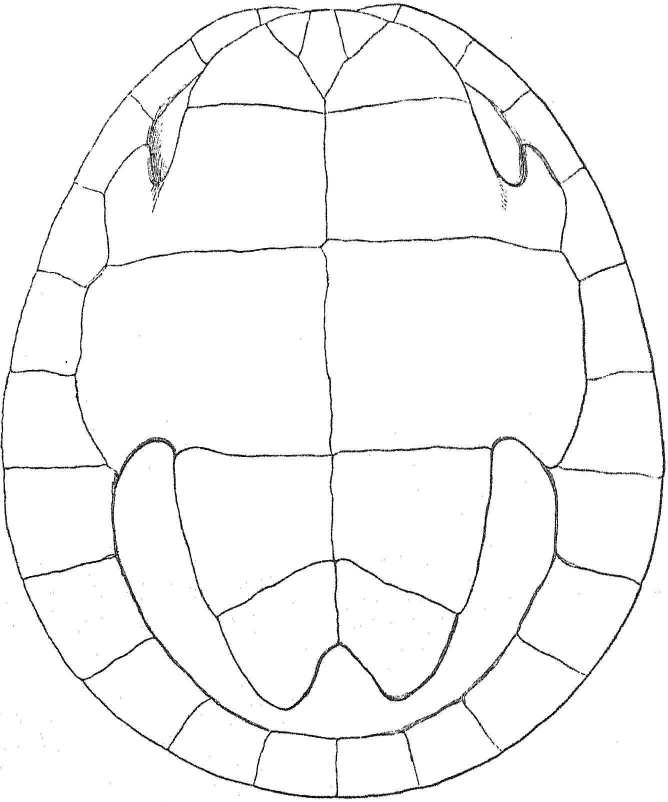
3. The Tortoise recently named by Dr. Gray *Bartlettia pitipii**, which Mr Bartlett met with only near Sarayaçu, on the Ucayali. This, he states, "lays from nine to twelve eggs only, on the flat sandbanks, about fifty or sixty yards from the water." The eggs, of which I exhibit two specimens from Mr. Bartlett's collection, are oblongo-oval in shape and soft-shelled, measuring 1·7 by 0·9 inch.

There is no question about this Tortoise being a *Podocnemis*, in my opinion, and probably of a species different from *P. expansa* and *P. dumeriliana*. But I consider that it may be referable to *Emys erythrocephala* of Spix, with which it agrees in nearly every particular. In the first place Spix's species is unquestionably a *Podocnemis*, but has been referred by some authors to *P. dumeriliana* and by others to *P. expansa*, both of which species Spix has figured under other names. Wagler, who had the advantage of the use of Spix's specimens, says (Nat. Syst. d. Amph. p. 135) "*Emys erythrocephala*, Spix, which belongs to this genus (*i. e. Podocnemis*) differs from *Emys expansa* only in the circular excavation at the end of the thorax by the tail. Perhaps this is only individual." The complete specimen of the so-called *Bartlettia pitipii* in the British Museum, as will be seen by the accompanying sketch (fig. 3, p. 748), presents this feature to a certain extent, although not to the extent given in Spix's figure.

* P. Z. S. 1870, p. 720.

The complete specimen of this *Podocnemis* in the British Museum has only one small central mental barbule.

Fig. 3.



Lower surface of shell of *Bartlettia pitipii*, Gray.

4. The fourth *Podocnemis* obtained by Mr. E. Bartlett was the small species, with its brilliantly yellow-spotted head, which Prof. Troschel has described as *Podocnemis unifilis*, and which, as already stated, is labelled in the British Museum as the young of *P. dumeriliana*.

Mr. Bartlett met with this Tortoise on the Ucayali near Sarayaçu, and believed his specimens to be full-grown. The specimen lately living in the Society's collection agrees very well with one of Mr. Bartlett's specimens in the British Museum. On examining the other specimens in spirits there, I find two small individuals which I believe to belong to the same species. These are both labelled *P. expansa*.

I think it is possible after all that *P. unifilis* may be only the young of *P. dumeriliana*; but I cannot consider that this is yet proved to be the case.

7. Remarks on a Collection of Birds from Oyapok. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received November 29, 1871.]

Madame Adèle Verdey, of 45 Rue Turenne, Paris, has lately sent to me for examination a considerable series of bird-skins collected by one of her correspondents at Oyapok—a place on the river of the same name which divides Cayenne from the northern frontier of Brazil. The collection is of much interest, as containing many forms which I have previously seen only from the Upper Amazons, such as *Euphonia rufiventris, Heterocnemis argentata, Pipra filicauda, Celeus grammicus* and others, mixed up with well-known Cayenne species.

There are also two apparently new species in the collection, concerning which I have the following notes to offer.

Family TYRANNIDÆ.

1. OCHTHOËCA MURINA, sp. nov.

Pallide murino-brunnea fere unicolor, pileo obscuriore: alis caudaque nigricantibus, marginibus pallidioribus: loris et oculorum ambitu flavidis: rostro et pedibus nigris: long. tota 5·4, *alæ* 3, *caudæ* 2·3.

Hab. Oyapok, Cayenne.

In general colour this species is very much like *Sayornis pallida*, but is rather paler and about half the size. I refer it, however, to *Ochthoëca*, from which the so-called genus *Sayornis* is scarcely separable. When instituting the genus *Ochthoëca* (Wiegm. Arch. 1847, p. 255), Dr. Cabanis assigned to it *Muscicapa saya*, though he subsequently transferred this species to *Aulanax* (J. f. O. 1856, p. 2).

I have at present specimens of the following sixteen species of this genus (in which I now include *Mecocerculus* of my Catalogue) in my collection:—

a. OCHTHODIAËTA, Cab.

1. *O. fumigata* (Boiss.); Cat. A. B. p. 198, ex Columbia et rep. Æquat.

b. OCHTHOËCA, Cab.

2. *O. fumicolor*, Scl. Cat. A. B. p. 198, ex Columb. et rep. Æquat.

3. *O. superciliosa*, Scl. et Salv. P. Z. S. 1870, p. 786, ex Venezuela alta.

4. *O. œnanthoides* (Lafr. et D'Orb.), ex Bolivia alta.
5. *O. polionota,* Scl. et Salv. P. Z. S. 1869, p. 599, ex Peruv. alta.
6. *O. leucophrys* (Lafr. et D'Orb.); Scl. et Salv. P. Z. S. 1867, p. 986, ex Peruv. alta.
7. *O. albidiema* (Lafr.); Scl. Cat. A. B. p. 199, ex Columbia.
8. *O. citriniƒrons,* Scl. P. Z. S. 1862, p. 113, ex rep. Æquat.
9. *O. lessoni,* Scl. Cat. A. B. p. 198, ex Columbia alta.
10. *O. nigrita,* Scl. et Salv. P. Z. S. 1870, p. 786, ex Venezuela alta.
11. *O. cinnamomeiventris* (Lafr.); Cat. A. B. p. 199, ex Columbia alta.

c. MECOCERCULUS, Scl.

12. *O. diadema* (Hartl.); Cat. A. B. p. 199, ex Columbia alta.
13. *O. gratiosa* (Scl.); P. Z. S. 1862, p. 113, ex rep. Æquat.
14. *O. setophagoides* (Bp.); *Mecocerculus leucophrys,* Scl. Cat. A. B. p. 199 (nec *Fl. leucophrys,* Lafr. et D'Orb.), ex Columbia alta et rep. Æquat.
15. *O. stictoptera* (Scl.); Cat. A. B. p. 199, ex Columbia alta et rep. Æquat.
16. *O. murina,* Scl., ex Cayenna.

I have never been fortunate enough to obtain specimens of the following:—

1. *O. rufipectoralis* (Lafr. et D'Orb.), ex Bolivia.
2. *O. rufo-marginata,* Lawr. Ann. L. N. Y. ix. p. 266, ex rep. Æquat.
3. *O. uropygialis*; *Mecocerculus uropygialis,* Lawr. Ann. L. N. Y. ix. p. 266, ex rep. Æquat.

Family COTINGIDÆ.

2. HETEROPELMA IGNICEPS, sp. nov.

Olivaceum: alis caudaque fuscis olivaceo limbatis: pilei cristati plumis mediis late et læte croceis, lateribus capitis cineracescenti-olivaceis: subtus valde dilutior, ventre medio et subalaribus flavis: rostro corneo, basi pallidiore, pedibus carneis: long. tota 5·2, *alæ* 2·8, *caudæ* 2·1.

Hab. Oyapok, Cayenne.

Obs. Similis *H. flavicapillo* ex Brasil. Merid. Or., sed crista splendide crocea, rostro latiore et ventre flavo differt.

Of this species two specimens are in the collection. It is manifestly a northern form of *H. flavicapilla,* but quite distinct. *H. chrysocephalum* of Pelzeln, of which I have a typical specimen, is much more like *H. aurifrons*; and I am a little doubtful about its real distinctness from that species.

8. Remarks on the Species of the Genera *Myiozetetes* and *Conopias*, belonging to the family Tyrannidæ. By P. L. Sclater, M.A., Ph.D., F.R.S.

[Received November 28, 1871.]

Mr. G. N. Lawrence, of New York, having kindly sent to me for examination some of the types of his newly described Tyrannidæ, and thus given me the opportunity of comparing them with the specimens in my own collection, I have drawn up a few notes on the species of two allied genera, *Myiozetetes* and *Conopias*, which may, I trust, serve to assist others in the task of determining these difficult birds.

First, as regards *Myiozetetes* *, Mr. Salvin and I, in some remarks on *Myiozetetes granadensis* (P. Z. S. 1867, p. 279), have proposed to divide the species of this genus allied to *M. cayennensis* as follows:—

a. Species with a clearly defined white superciliary stripe.	
a'. Species with the primaries externally narrowly bordered with rufous, and with the basal half of the inner webs of both primaries and secondaries broadly margined with pale rufous	1. *M. guianensis.*
b'. Species without rufous edgings to primaries, embracing four local forms, which require further examination	2. *M. texensis.* 3. *M. columbianus.* 4. *M. cayennensis.* 5. *M. similis.*
b. Species without a white superciliary stripe	6. *M. granadensis.*

The examination of the specimens which I have more recently met with, together with the assistance I have received from Dr. Finsch's excellent remarks on this genus (P. Z. S. 1870, p. 569), have induced me slightly to alter my views, and to propose to arrange the species of *Myiozetetes* in the following way:—

a. Superciliis albis.	
a'. primariis extus et intus rufo limbatis	1. *erythropterus.* 2. *rufipennis.* 3. *cayennensis.*
b'. prim. extus rufescente intus fulvo limbatis	4. *similis.*
c'. prim. extus viridi intus fulvo limbatis	5. *texensis.*
b. superciliis nullis	6. *granadensis.* 7. *luteiventris.* 8. *sulphureus.*

At the same time I must say that I am by no means satisfied as to the validity of all the species of section *a*, as in some cases, as I shall presently show, they certainly run into one another.

1. Myiozetetes erythropterus.

Tyrannula erythroptera, Lafr. Rev. Zool. 1853, p. 56.

Hab. S.E. Brazil; Minas Geraes (*Rogers*).

This species I put first, as having the greatest development of red on the wings. In *M. erythropterus* nearly the whole of the basal two thirds of the remiges are of a chestnut-red; and a conspicuous red patch on the wing is thus formed. Except in the first primary, the black colour is confined to a very narrow line on each side of the shaft. In the secondaries the outer web is black, narrowly edged with red; the inner web nearly wholly red. The whole wing-end and outer secondaries are black.

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* As to the origin of this generic term, see P. Z. S. 1859, p. 46.

I have two specimens of the bird in my collection—one obtained from a dealer, the other transmitted by Mr. Rogers from Minas.

This species (or subspecies of *M. cayennensis*, whichever it may be) is of larger size than *M. cayennensis* from Cayenne. I measure as follows:—

			Long. tota.	Alæ.	Caudæ.
M. erythropterus	Mus. P. L. S.	*a*	7·0	3·9	3·2
" "	" "	*b*	7·5	4·0	3·4
M. cayennensis...	Mus. G. N. L. ex Cayenne ...	*a*	6·2	3·2	2·7
" "	" " " ...	*b*	5·7	3·2	2·6
M. rufipennis ...	Mus. P. L. S. ex Venezuela .	...	6·6	3·5	3·0

2. MYIOZETETES RUFIPENNIS.

Myiozetetes rufipennis, Lawr. Ann. L. N. Y. ix. p. 267.

Myiozetetes cayennensis, Scl. et Salv. P. Z. S. 1868, p. 628.

This form is intermediate between *M. cayennensis* and *M. erythropterus*. Mr. Lawrence's typical specimen agrees very nearly with Goering's skin from San Esteban, which Mr. Salvin and I did not venture to separate from *M. cayennensis*.

M. rufipennis has not quite so much red on the wings as *M. erythropterus*, the dark line adjoining the outside of the shaft of the primaries being broader. Judging from the two specimens examined, the bird is also not quite so long-winged as the Brazilian form.

3. MYIOZETETES CAYENNENSIS.

Muscicapa cayennensis, Linn. S. N. i. p. 327 (ex *M. cayenn.* Briss. Orn. ii. p. 404).

Elænea cayennensis, Cab. in Schomb. Guian. iii. p. 701.

Myiozetetes cayennensis, Finsch, P. Z. S. 1870, p. 569.

Myiozetetes guianensis, Cab. et Hein. Mus. Hein. ii. p. 61; Scl. P. Z. S. 1860, p. 283; Cat. A. B. p. 219; Scl. et Salv. P. Z. S. 1867, p. 279, 1868, p. 168.

Myiozetetes marginatus, Lawr. Ibis, 1863, p. 182.

I have hitherto applied the Linnean term *cayennensis* to the southern form of *M. texensis*, without rufous margins to the wings. Dr. Finsch, however, in his remarks above mentioned, has shown conclusively that the *Muscicapa cayennensis* of Linnæus (founded on *M. cayennensis* of Brisson) has the remiges externally margined with rufous. There can be no doubt, therefore, that the name *Myiozetetes cayennensis* is correctly applicable to the bird which I have hitherto usually called *M. guianensis*.

Two Cayenne skins of this species are in Mr. Lawrence's collection, and agree very well with specimens in my collection from Bogota and from Panama. Fraser's skins from Babahoyo must also be referred here, although they approximate somewhat to the Venezuelan form (*M. rufipennis*).

The typical specimen of Mr. Lawrence's *M. marginatus* (from Panama) is a young bird in my opinion, showing for that reason narrow edgings to the wing-coverts and broader rufous margins to the tail-feathers. But I cannot separate it specifically from other specimens of *M. cayennensis* from the same district.

4. MYIOZETETES SIMILIS.

Muscicapa similis, Spix, Av. Bras. ii. p. 18, pl. 25.

Muscipeta cayennensis, Lafr. et D'Orb. Syn. Av. i. p. 47; D'Orb. Voy. Ois. p. 317.

Tyrannula similis, Hartl. Verz. Mus. Brem. p. 49.

Elænea miles, Burm. Syst. Ueb. ii. p. 474.

Myiozetetes similis, Cab. et Hein. Mus. Hein. ii. p. 61; Sclater, Cat. A. B. p. 219; Finsch, P. Z. S. 1870, p. 569.

Myiozetetes cayennensis, Scl. et Salv. P. Z. S. 1869, p. 598.

In all freshly moulted specimens of the species which I have seen, there are narrow rufescent edgings to the primaries; and in this stage it is somewhat hard to give good characters to separate it from *M. cayennensis*. It is, however, always of considerably larger dimensions, and has the inner margins of the primaries paler and more of a yellowish than rufous tint. When the rufescent outer edgings of the primaries wear off, the species comes nearer to *M. texensis*, but has the back generally of a darker olive.

Mr. Lawrence sends me a skin of *Myiozetetes* from Peru (Prof. Orton), which agrees very well with others in my collection obtained by Mr. Whitely at Cosnipata in Peru, and by Fraser at Esmeraldas in Ecuador, the latter being a trifle smaller. Mr. Lawrence has given the MS. term *grandis** to his skin; but I am inclined to refer all three to *M. similis*.

5. MYIOZETETES TEXENSIS.

Tyrannula cayennensis, Sw. Phil. Mag. 1827, i. p. 367.

Muscicapa texensis, Giraud, B. of Texas, pl. 1; Sclater, P. Z. S. 1855, p. 65.

Elænia texensis, Sclater, P. Z. S. 1856, p. 296.

Elænia mexicana, Kaup, in Mus. Berol. et Hein.

Myiozetetes texensis, Sclater, P. Z. S. 1859, p. 56, et Ibis, 1859, p. 443; Sclat. et Salv. Ibis, 1859, p. 123, P. Z. S. 1870, p. 837; Cab. et Hein. Mus. Hein. ii. p. 62; Finsch, P. Z. S. 1870, p. 569.

Myiozetetes colombianus, Cab. et Hein. Mus. Hein. ii. p. 62; Sclater, Cat. A. B. p. 219; Scl. et Salv. P. Z. S. 1864, p. 359; Salvin, P. Z. S. 1870, p. 196; Finsch, P. Z. S. 1870, p. 569.

Myiozetetes cayennensis, Sclater, Cat. A. B. p. 219.

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* Recently published, see Proc. Ac. Sc. Phil. 1871, p. 234.

Of this species I have examined a large number of specimens (ten in my own collection, and eighteen in that of Messrs. Salvin and Godman), and have quite come to the conclusion that Dr. Finsch is right in saying that the so-called *M. colombianus* is not really separable. The series examined contains skins from every part of the Central American Isthmus, from Southern Mexico down to Panama, and from Columbia, Venezuela, and Trinidad, the last-named locality not being quite certain. The southern specimens are generally smaller in dimensions.

In this bird the remiges are narrowly bordered externally with yellowish, and internally with pale fulvous. In neither case is there any decided rufous tint.

I have a small Bogota skin of this species, which appears to agree very fairly with Heine f.'s description of his *M. icterophrys* (J. f. O. 1861, p. 197); and there are similar skins from Venezuela in Mr. Lawrence's collection. But, in spite of what Dr. Finsch says (P. Z. S. 1870, p. 569), I think the differences are not sufficient to establish a species upon.

6. MYIOZETETES GRANADENSIS.

Myiozetetes granadensis, Lawrence, Ibis, 1862, p. 11; Sclater, Cat. A. B. p. 219; Sclater et Salv. P. Z. S. 1864, p. 359, 1867, p. 979, et 1869, p. 598.

This is a very distinct species, about which there can be happily no question. I have skins of it from Honduras, Panama, Bogota, and Western Peru, and have compared them with Mr. Lawrence's type from Panama.

M. granadensis is readily known from all the preceding species by the entire absence of the white eyebrows. The head is plumbeous, with a concealed median crest of bright scarlet (in the adult), and with the frontal feathers more or less whitish. The back is olive-green. The wings and tail are narrowly edged externally with greenish, and internally more broadly margined with pale yellowish.

7. MYIOZETETES SULPHUREUS.

Muscicapa sulphurea, Spix, Av. Bras. ii. p. 16, pl. 20.

Tyrannula peruviana, Lafr. Rev. Zool. 1853, p. 56.

Myiozetetes sulphureus, Cab. et Hein. Mus. Hein. ii. p. 61; Sclater, Cat. A. B. p. 220; Pelzeln, Orn. Bras. p. 109.

About this species there can be also no question, its great size rendering it at once recognizable *. The concealed crest is of a fine orange-yellow.

Mr. E. Bartlett brought two skins of this *Myiozetetes* in his latest collection from Chamicuros, Eastern Peru, one of which is now in Messrs. Salvin and Godman's collection. The only skin I have is also from Eastern Peru. Natterer obtained this bird in Central Brazil.

8. MYIOZETETES LUTEIVENTRIS.

Elænea luteiventris, Sclater, P. Z. S. 1858, p. 71.

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* Long. tota 8, alæ 4·3, caudæ 3·1.

Myiozetetes luteiventris, Sclater, Cat. A. B. p. 219; Pelz. Orn. Bras. p. 109.

This species I founded, in 1858, upon a skin, in not very good plumage, obtained, through the Maison Verreaux, from the Rio Napo. I have been recently fortunate enough to find a second example in a collection of birds from Oyapok, in Cayenne, transmitted to me for examination by Madame Verdey of Paris. This second skin is also not quite adult, but shows a small concealed crest, proving that, as H. v. Pelzeln has already pointed out in his remarks (Orn. Bras. p. 109), this species is not different in this respect from other members of this group. I use this specimen to amend the specific characters formerly given, as follows:—

MYIOZETETES LUTEIVENTRIS.

Obscure olivaceus, alis caudaque fusco-nigris, rufescente marginatis: crista pilei celata igneo-rubra flavo mixta: gutture albo; abdomine et subalaribus flavis: remigum marginibus interioribus pallide rufescentibus: long. tota 5·3, *alæ* 2·75, *caudæ* 2·3.

Hab. Eastern Ecuador; Rio Negro and Rio Maderira (*Natt.*); Cayenne.

This species forms a very distinct third member of the second section of *Myiozetetes*, without the white superciliaries. It is not unlike *M. granadensis*, but smaller in size and much darker above.

So much for the species of *Myiozetetes*. Of the nearly allied genus *Conopias*, Cab. & Hein.*, I have only recognized one species in my American Catalogue, namely *Conopias superciliosa* = *Tyrannula superciliosa*, Sw. (1841). I now find that Swainson's name must give place to *trivirgata* of P. Max. (1831), this bird being clearly the *Muscicapa trivirgata* of Max. Beitr. iii. p. 871. This synonym was wrongly referred in my American Catalogue to *Myiozetetes similis*.

Closely allied to *C. trivirgata*, but distinguishable by its larger size, white throat, and brown back, is *Myiozetetes inornatus* of Mr. Lawrence. Tschudi's *Tyrannus cinchoneti* (of which I have lately obtained a Bogota skin) seems to be a third allied species. All these three Tyrants have broad and distinct superciliary markings prolonged to the nape, and a dark pileus without any coronal patch. Their synonymy will stand as follows:—

1. CONOPIAS TRIVIRGATA.

Muscicapa trivirgata, Max. Beitr. iii. p. 871 (1831).

Tyrannula superciliosa, Sw. Orn. Dr. pl. 46; Burm. Syst. Ueb. ii. p. 475.

Muscicapa pitangula, Licht. in Mus. Berol.

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* Mus. Hein. ii. p. 62 (1859). Mr. G. R. Gray (Hand-list, i. p. 354) seems to give *Myiadeptes* of Reichenbach (1850) priority. But I cannot admit that a mere cut of the head and wing (such as that in Reichenbach's Systema, pl. lx.), without even a type species named, is sufficient to establish a priority.

Conopias superciliosus, Cab. et Hein. Mus. Hein. ii. p. 62 (note); Scl. Cat. A. B. p. 221.

Hab. S.E. Brazil (*Max.* et *Burm.*).

2. CONOPIAS INORNATA.

Myiozetetes inornatus, Lawr. Ann. L. N. Y. ix. p. 268; Finsch, P. Z. S. 1870, p. 569.

Hab. Valencia, Venezuela (*Lawr.*); Trinidad (*Finsch*).

3. CONOPIAS CINCHONETI.

Tyrannus cinchoneti, Tsch. Faun. Per. p. 151, pl. viii. fig. 2.

Hab. Peru (*Philippi*); Bogota (*Mus. P. L. S.*).

9. Note on a Variety of *Felis rubiginosa* from Ceylon.

By E. W. H. HOLDSWORTH, F.L.S., F.Z.S., &c.

[Received December 4, 1871.]

Before speaking particularly of this variety it may be desirable to give a short account of what is known of the habits and geographical range of the species.

Felis rubiginosa of Is. Geoffroy is a small species of true Cat, and has apparently but a very limited distribution, being restricted, according to Jerdon, to the Carnatic on the south-east of India and to the island of Ceylon. It has never, I believe, been brought alive to Europe; and specimens are not numerous in museums, either in this country or elsewhere.

In Ceylon, which is peopled by races speaking two very distinct languages, Tamil and Singhalese (the former being the language of the north and the latter of the south, the two overlapping in the central and more civilized districts of the island) this Cat is known to some of the native hunters by the name of *Verewa poony* in Tamil and *Coolla deeya* in Singhalese. In the northern district of Ceylon, however, which generally resembles in character the Carnatic, this species is very rare; and the one example I met with is the only specimen I have heard of that has been obtained in that part of the island. Liberal rewards offered to native hunters, during several months, for specimens alive or dead entirely failed in procuring any more; and the Government Agent of the Northern Province, who had been resident in that large district for very many years, and who, from his official position and known tastes, would be likely to have rarities brought to him, had never seen or heard of this red-spotted Cat until I showed him the specimen I had obtained. It may be considered, therefore, tolerably certain that in that part of Ceylon nearest to India, and resembling it most in physical characters, this species, strangely enough, is almost unknown, although in other respects there is a general similarity in the productions of those parts of the two countries.

The manners of *Felis rubiginosa* are, so far as I have had the means of observing them, those of the true Cats, shown by its stealthy walk and watchful looks above and around it; and I may add that the example I met with, although hit all over by a charge of large shot, fought hard for its life, and some minutes elapsed before I could safely lay my hands upon it. It preys on birds and small quadrupeds.

Although nowhere common in Ceylon, this Cat is found more frequently on the hills than elsewhere; and I have examined three specimens which were procured within a few miles of Kandy, probably at an elevation of from 1500 to 2000 feet. The hill-country, I may mention, occupies the centre of the southern two thirds of the island; and it is from that region that most of the rarer and peculiar members of the Ceylonese fauna are obtained. Jerdon speaks of this animal in India as especially frequenting open grassy places and the neighbourhood of villages, and also mentions, on his own authority and on that of correspondents, that hybrids are not unfrequently produced between this species and the domestic Cat. I have very little doubt that *Felis rubiginosa*, the animal I am now speaking of, is the one to which Jerdon refers; but I must say, from my own experience, and from what I have heard of the animal, that in Ceylon it is a true jungle Cat, and hybrids from it are there unknown. The specimen I shot was walking along one of the ordinary narrow game-paths in wild jungle, more than two miles from the nearest native dwelling; and although I knew of one instance in which it was killed very close to Kandy, that would not lead one to expect this Cat would be generally found in the neighbourhood of towns or villages; for at Kandy the primitive jungle, that which has never been cleared or disturbed, is only separated by a little-frequented road from the gardens of the Governor's official residence; and taking the year round there is hardly any locality in the island which is so productive of rare and peculiar species of birds and quadrupeds as this particular jungle. I have thought it right to mention this, because the distribution and habitats of the Ceylon fauna do not appear to agree in all cases with what are found in other countries producing similar forms.

To return to this Cat: the four examples I saw in the island (one of them killed by myself) agreed perfectly in the characteristic colour and markings of the species; the general ground-colour of the animals was a light greyish fawn, striped on the head and back, and spotted on the sides and legs with bright rusty brown. This general rusty colour of the markings has suggested its specific name, and it is generally known as the Red-spotted Cat.

The late Dr. Kelaart, who with Mr. Edgar Layard did so much towards working out the natural history of Ceylon, mentions, however, in his 'Prodromus Faunæ Zeylanicæ,' that specimens of this Cat from Nuwara Eliya (6000 feet) are darker-coloured and more spotted (probably he meant more distinctly spotted) than those from a less elevation; and I now wish to bring before the Society what I believe is an undoubted example of *Felis rubiginosa*, but which differs so much from the typical character that hardly any trace of rust-colour is perceptible, and the various markings, although true in position, are almost of a dark brownish black, whilst the original greyish colour of the ground has a larger element of fawn in it.

I have no means of knowing with certainty from what point of the hills this strongly marked variety was procured; but it was recently sent to me from Ceylon, and was obtained from the same person, a collector at Kandy, in whose hands I saw the three specimens previously mentioned. As most of the things which are brought to this person are collected within a radius of twelve or fifteen miles of Kandy, it is very probable that this specimen was not from any of the higher ranges of hills.

P.S.—This variety has been examined by Dr. Jerdon and Mr. Blyth, and has been pronounced by the latter to be the same as that on which he founded his new Indian species, *F. jerdoni* (P. Z. S. 1863, p. 185).

10. Remarks on various Species of Felidæ, with a Description of a Species from North-Western Siberia. By D. G. Elliot, F.L.S., F.Z.S., &c.

[Received December 5, 1871.]

(Plate LXXVI.)

Having had occasion lately to visit the Leyden Museum, in order to make some investigations in the difficult group comprising the genus *Felis*, I ascertained some facts which I consider may be useful for naturalists to know, and have therefore embodied them in the present communication. In the 'Monographies de Mammalogie,' published in 1827, Temminck described a Cat under the name of *Felis aurata*, the type of which had been purchased from a London dealer, and its habitat therefore not correctly known. The Golden Cat from Sumatra, Borneo, and Nepal, named by Hodgson *F. moormensis* (P. Z. S. 1832, p. 10), has been considered by mammalogists generally to be the same as the one described by Temminck, and it has been quoted and figured under the name of *aurata* in various publications by the majority of authors. It was therefore with no little surprise that, on seeing the typical *F. aurata* in Leyden, I ascertained that it was not the *F. moormensis* of Hodgson, but a species inhabiting the Gold Coast, which had been named *rutila* by Waterhouse in the 'Proceedings of the Zoological Society' for 1842, p. 130. The two animals from Nepal &c., and from Africa, resemble each other in being both of a general red colour; and therefore it was excusable that authors, judging only from descriptions, and not having seen Temminck's type, should have confounded it with Hodgson's species, which, however, is very distinct. Prof. Schlegel had intended to publish a memoir upon this species of M. Temminck, in order to place the matter in its proper light, but gave up the project on learning that I was investigating the group; and I take this opportunity of expressing my thanks for his kindness and assistance during the time I was at work in the magnificent museum over which he so worthily presides.

In the same monograph already mentioned, M. Temminck has also described a Cat, which he procured at the sale of Mr. Bullock's collection in London, as *F. celidogaster*, the habitat being then unknown; but in the 'Esquisses Zoologiques,' published in 1853, p. 86, he redescribes the species from a specimen received from the coast of Guinea. This supposed distinct species, however, proves to be only a light-coloured variety of Temminck's *Felis aurata* from the same locality, as there is in the museum a flat skin, also from the Gold Coast, of a Cat which is intermediate between the two extremes deemed distinct by Temminck. In the 'Annals and Magazine of Natural History' (1838), vol. i. p. 27, Dr. J. E. Gray described a Cat from the Gambia as *F. neglecta*. It was founded on a flat skin wanting the head. By the kindness of Prof. Schlegel I have been enabled to bring the type of *F. celidogaster* to London, and compare it with Dr. Gray's *neglecta*, and I find that the two are identical and cannot be separated. The synonymy, then, of the two species described respectively by Temminck and Hodgson from the Gold Coast and Nepal will be as follows:—

FELIS AURATA.

Felis aurata, Temm. Mon. Mamm. 1827, p. 120; Vig. Zool. Journ. vol. ii. p. 530.

Felis rutila, Waterhouse, Proc. Zool. Soc. 1842, p. 130; Gray, Proc. Zool. Soc. 1867, pp. 272, 395; *id.* Cat. Carn. Mam. 1869, p. 23. sp. 14.

Felis celidogaster, Temm. Mon. Mamm. 1827, p. 140; *id.* Esquiss. Zool. 1853, p. 86 (light variety).

Felis neglecta, J. E. Gray, Ann. & Mag. Nat. Hist. 1838, vol. i. p. 27; Sclat. Proc. Zool. Soc. 1860, p. 246 (light variety).

Felis chalybeata, H. Smith, Griff. Anim. King. 1827, vol. ii. p. 474. pl. (light variety).

General colour above red, indistinctly spotted on the sides, spots small in size; beneath white, spotted with blackish brown; tail red above, white beneath, unspotted; no white marks upon the face, which is of the same red colour as the back and sides.

Hab. Gold Coast of Africa.

FELIS MOORMENSIS.

Felis moormensis, Hodgson, Proc. Zool. Soc. 1832, p. 10.

Leopardus auratus, J. E. Gray, Proc. Zool. Soc. 1867, p. 265; *id.* Cat. Carn. Mam. 1869, p. 12.

Felis aurata, Sclat. Proc. Zool. Soc. 1867, p. 815, pl. 36, et 1868, p. 647; Blyth, Proc. Zool. Soc. 1863, p. 185.

Felis temminckii, Vigors and Horsf. Zool. Journ. vol. iii. p. 451 (jun.).

Upper parts rich brown-red; ears and tip of tail black; markings on the face buff, edged with black; underparts much paler than the upper, inside of the fore legs whitish buff, crossed with several dusky bars; upper lip pale buff, with three parallel rows of black dots; lower lip and chin white; underpart of tail white.

Hab. Nepal, Sumatra, Borneo.

In 1863 Mr. Blyth, in his list of the Asiatic species of the genus *Felis*, published in the 'Proceedings' of the Zoological Society, separated as *F. jerdoni* a small Cat, habitat unknown, but supposed to be the peninsula of India, resembling in size the *F. rubiginosa*, and in markings the *F. bengalensis* of Desm. By the kindness of Mr. E. W. H. Holdsworth, I have been put in possession of two Cats collected by him at Aripo, north-west Ceylon, one of which is typical *F. rubiginosa*, and the other rather intermediate between that species and *F. jerdoni*. This would prove that Mr. Blyth's species is only a dark form of *F. rubiginosa*—a fact not to be wondered at, as dark and light varieties among the species of *Felis* are of very common occurrence. I should state that Mr. Blyth has seen the specimens here alluded to, and agrees with me that his *F. jerdoni* must now be considered the same as *F. rubiginosa*.

The synonymy of the species will be somewhat as follows:—

FELIS RUBIGINOSA.

Felis rubiginosa, I. Geoff. Voy. Bélanger, Zool. p. 140, pl. 6; Blyth, Proc. Zool. Soc. 1863, p. 185.

Viverriceps rubiginosa, J. E. Gray, Proc. Zool. Soc. 1867, p. 269; *id.* Cat. Carn. Mamm. 1869, p. 18.

Felis jerdoni, Blyth, Proc. Zool. Soc. 1863, p. 185; J. E. Gray, Proc. Zool. Soc. 1867, pp. 274, 401.

Leopardus sumatranus, Gray, Cat. Mam. B. M. p. 43.

The dark specimen from Ceylon, although apparently full-grown, is still quite young, the teeth being still those of a kitten.

The remaining species to which I would call the attention of naturalists is one described and figured by Radde, in the 'Reisen im Süden von Ost-Sibirien,' 1862, p. 106, as *Felis undata*, Desmarest. A short time since Mr. A. D. Bartlett, the Superintendent of the Zoological Gardens in Regent's Park, lent me a skin of a Cat, stated to have come from Siberia, which appeared different from any which I had previously seen; but on comparing it with Radde's description of *F. undata* it was apparently the same.

On looking at the original description of *F. undata* ('Nouveau Dictionnaire d'Histoire Naturelle,' vol. vi. p. 115) I found it was established upon a Cat from India, said to be little smaller than the *F. javanensis*, described on the same page, and also compared with the "*Chat sauvage Indien*" of Vosmaer. Judging from the plate, Vosmaer's animal is only a domestic Cat, and at all events is totally different from the animal figured by Radde, which in many particulars does not resemble any Cat known to inhabit India, possessing, among other characteristics, a short rather bushy tail, quite different from the slender tails of the small Cats which are known to inhabit the southern part of Europe and Asia. Desmarest's name of *undata* will therefore have to become a synonym, probably of *F. javanensis*, if that is allowed to be a different species from *F. undata*, Temm., as his description and plate are so unsatisfactory as to render it impossible to make out what animal was intended; and Radde's species will require a new name, as it is evident it cannot be considered identical with any Indian Cat, nor does it resemble any species yet described from northern Asia. I would therefore propose that it should be known as

FELIS EUPTILURA. (Plate LXXVI.)

Felis undata?, Radde, Reisen im Süden von Ost-Sibirien, 1862, p. 106, pl. 4.

Ground-colour of the body light brownish yellow, strongly mixed with grey, covered with reddish-brown spots rather oblong in shape, darkest and most conspicuous on the hind quarters; head grey, with a white line under the eye and on the side next to the nose; two dark brown stripes in the centre, commencing at the top of the nose, and one on each side beginning at the eye, pass over the top of the head, and down the back of the neck to the shouders; a dark-red stripe from the corner of the eye runs back across the cheek to the base of the ear; and another rather lighter in colour, starting below the eye, passes across the cheek and curves back under the throat. The centre of the back much darker than the sides, with spots of dark brown. Under lip white, as is also the throat and underparts. Across the upper part of the breast are four broken bands of foxy red; belly covered with large brown spots, becoming rufous between the hind legs. Inner side of hind legs buff, with cross bands of foxy red, and covered with small reddish spots to the toes. Tail thick, rather short, bushy, darker than the body, with several incomplete broken rings of blackish brown. Inside of ear buff, behind black. In size the animal appears somewhat larger than the ordinary domestic Cat. The skin, unfortunately, is in a very bad condition, the hair falling off at the slightest touch.

11. Examination of certain "Remarks on Indian Fishes" made by Mr. Francis Day in the 'Proceedings of the Zoological Society.' By Dr. ALBERT GÜNTHER, F.Z.S.

[Received December 5, 1871.]

At the Meeting of the Zoological Society held Nov. 7th, 1871, a paper by Mr. Day was read, entitled "Remarks on Indian Fishes," in which he attempts to disprove the correctness or justice of some critical observations made by me in the 'Zoological Record' for 1869. Some of these "remarks" do not require a reply, as Mr. Day merely repeats his former statements, and zoologists specially interested in the matter have only to consult what has been written upon it, and then can judge for themselves whether I have misunderstood Mr. Day (which I deny), or whether it is not rather he who has repeatedly misrepresented the author of the 'Catalogue of Fishes'*. But there are other remarks, in which Mr. Day has brought forward fresh facts which, in the interest of truth, must be examined; and being based upon materials in the British Museum, they require notice on my part. They are the following:—

1. *Is the type of* Pseudeutropius longimanus (*Gthr.*) *one of Colonel Sykes's specimens of* Hypophthalmus taakree?

Mr. Day says:—"Sykes described two species of *Hypophthalmus*, the *taakree* and *goongwaree*, and placed his typical specimens in the collection of the Zoological Society, which was subsequently transferred to the British Museum. Neither of Sykes's typical specimens, however, finds a place in the 'Catalogue of Fishes in the British Museum.' Having been courteously permitted† by Dr. Günther, in 1870, to examine *Pseudeutropius longimanus*, Günther (stated in the Catalogue to be '*a*. Skin, 6 inches long: not good state. India. From the Collection of the Zoological Society'), I was surprised to find *it was one of Sykes's specimens*, a fact overlooked when the 'Catalogue' was compiled. Attached to it was the following label:—'940. Zool. Soc.,' and '*Hypophthalmus goongwaree* (13–6–/57),' evidently a transposition of labels from the *H. taakree*."

It would seem, at first, almost incredible that this elaborate statement of Mr. Day proceeds entirely from his own imagination and is wholly fallacious.

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* Take, for instance, a case from Mr. Day's recent "remarks." He had stated in Proc. Zool. Soc. 1869, p. 371, that *Crossochilus rostratus* (Gthr.) was identical with *Cyprinus bata* (H. B); and I set him right on this point in the 'Record' for that year in the words quoted by Mr. Day. But, instead of frankly admitting that he had been mistaken in the matter, he states: "As regards *Crossochilus rostratus*, Günther, *from the description as now given, it appears to resemble* B. bata, H. B., excepting in having a pair of rostral instead of a pair of maxillary barbels." The italics are my own. Now will Mr. Day point out where I have given this second description, or whether I have added one iota to my original description in 1868? and is it not apparent that he intended to convey an erroneous idea to those of his readers who are not acquainted with the details of the history of the fish (for he could scarcely hope that I would accept such an answer), viz. the idea that it was only by the "description as now given" that he was enabled to perceive the difference between the two fishes?

In the first instance, Mr. Day gave as one of the reasons for identifying these two fishes, having found some of his specimens of *C. bata* (?) in the Cossye river, whence the *Crossochilus rostratus* in the British Museum was obtained. This is certainly a point for consideration, but too much weight should not be laid upon it. No doubt Mr. Day, on a visit to a locality, employs every means to collect as many fishes as possible; but it were an illusion to think that he has obtained during a temporary stay all the fishes or even the greater part of the species noticed by previous visitors or residents.

† I accept this as a complimentary remark, but must observe that none of the employés of the Trustees of the British Museum have the power of permitting or denying access to the collections to a student of natural history.

When, in 1857, the most important part of the collection of the Zoological Society was purchased by the Trustees of the British Museum, the register of that collection was fortunately obtained at the same time. In that register every fish possessed by the Society was entered, under a separate number, with the name of the donor and other particulars; but the name of Col. Sykes does not appear once. Nor is there the slightest indication in Col. Sykes's paper in the 'Transactions of the Zoological Society' that he presented specimens of the fishes described to the Society. The plates in the 'Transactions' were not made from specimens, but copied from native drawings brought home by him. Col. Sykes appears to have sent specimens of various fishes to the Museum of the late East-India Company; but, although I searched carefully that museum (before and after the transfer of its fish-collection to the British Museum) for types of Col. Sykes's paper, I failed to discover them, There were other fishes said to have been sent by Col. Sykes; but they had nothing to do with his paper on the Dukhun fishes, and were preserved in spirits.

Thus there is sufficient evidence to show that no typical specimen was placed by Col. Sykes in the collection of the Zoological Society; and I proceed to trace the history of the specimen of the *Ps. longimanus* by the aid of the same register. Two labels are attached to it:—

a. The round original label used by the curator of the Zoological Society for the skins of fishes, with the no. 940 written on it. On referring to this number in the register I find the following entry in the handwriting of Mr. G. R. Waterhouse, then curator of the Zoological Society:—

"1834. Dec. 3. *Pimelodus vacha*. India. Presented by J. Willie, Esq."

So much for Mr. Day's discovery that "*it was one of Sykes's specimens*." It had been presented with others to the Society by Mr. Willie in 1834—that is, five years before Col. Sykes communicated his paper to the Zoological Society. Further, on inquiring of Mr. Waterhouse as to who had named it "*Pimelodus vacha*," he replied that he himself had named the fishes in a preliminary manner; and for that purpose, and at that time, Mr. Waterhouse's determination was sufficiently approximate to the truth.

b. The second label was placed in 1857 by the curator of the British Museum, Mr. Gerrard, and bears, in his handwriting, our register mark, and the name of *Hypophthalmus goongarensis*, Sykes. Whether he, or somebody else who studied the fish after the publication of Sykes's paper, applied this name to it, he cannot remember. The name having been latinized, it was probably done by Bennett. However, this is of no consequence; and the "transposition of labels" which is said to have taken place is merely a convenient supposition of Mr. Day (used by him not for the first time), without even a shadow of probability in this case.

For completeness' sake I may mention another fact which is passed over in silence by Mr. Day, although it may have (unfortunately) assisted him in determining this example as one of Sykes's specimens of *H. taakree*. When I examined it for the first time in 1863, I thought it might be the *taakree* of Sykes, and wrote this name on the label of the bottle*; but having convinced myself that it was not likely to be this fish, I drew my pen through the name, and wrote below *longimanus*.

2. *Has* Cyprinus bata (*Ham. Buch.*) *nine, or ten branched rays in the dorsal fin?*

The words of Hamilton Buchanan, that this fish has "twelve rays in the fin of the back," . . . . . "the first" and "second" being "undivided; the others are branched, the last of them being divided to the root," have always conveyed to my mind the idea that this fish was described, as clearly as possible, as a fish with ten branched dorsal rays. Surely no author would count the same ray in one line of the description as two, and in another as one, "the last" being clearly the singular and not the plural form. If "the last" had been meant for two rays, Hamilton Buchanan would have written "the *two* last"! However, it requires but slight acquaintance with Hamilton Buchanan's work to see that his rule was to count the last ray (which is *generally* split to the base) as one, and not as two. Mr. Day's statement to the contrary is to me quite incomprehensible; he needed only to compare Buchanan's description with the plates. When we take, for instance, the five species succeeding *Cyprinus bata* (viz. *C. boga, catla, gonius, calbasu,* and *nandina*) and the five preceding it (viz. *C. mrigala, dero, cocsa, bacaila,* and *morar*) and compare their descriptions with the figures, we find that Buchanan has invariably counted the ray in question as a *single* ray. The only case which shows some obscurity is that of *C. dero*. In *C. mrigala* Buchanan *expressly* mentions the number of branched rays in the text; and the description of *C. sarana* (pp. 307, 309) offers another striking instance, disproving Mr. Day's assertion. Finally, to set the matter beyond further dispute, also with regard to *C. bata*, I give (see p. 765) an exact tracing of H. Buchanan's MS. drawing of this fish, in which the ten separate branched dorsal rays are as clearly shown as could well be done.

3. *What are the relations between* Barbus beavani (*Gthr.*) *and* Cyprinus chagunio (*H. B.*)?

Mr. Day states that "amongst Hamilton Buchanan's original drawings exists one of *C. chagunio*, and labelled as such." No doubt such a drawing would considerably assist us in answering the question.

In the British Museum copy of those drawings (which always was believed to be complete) no such drawing exists, nor any thing approaching *Barbus beavani*. Therefore I have applied to the Librarian of the Asiatic Society of Bengal for a tracing of the drawing

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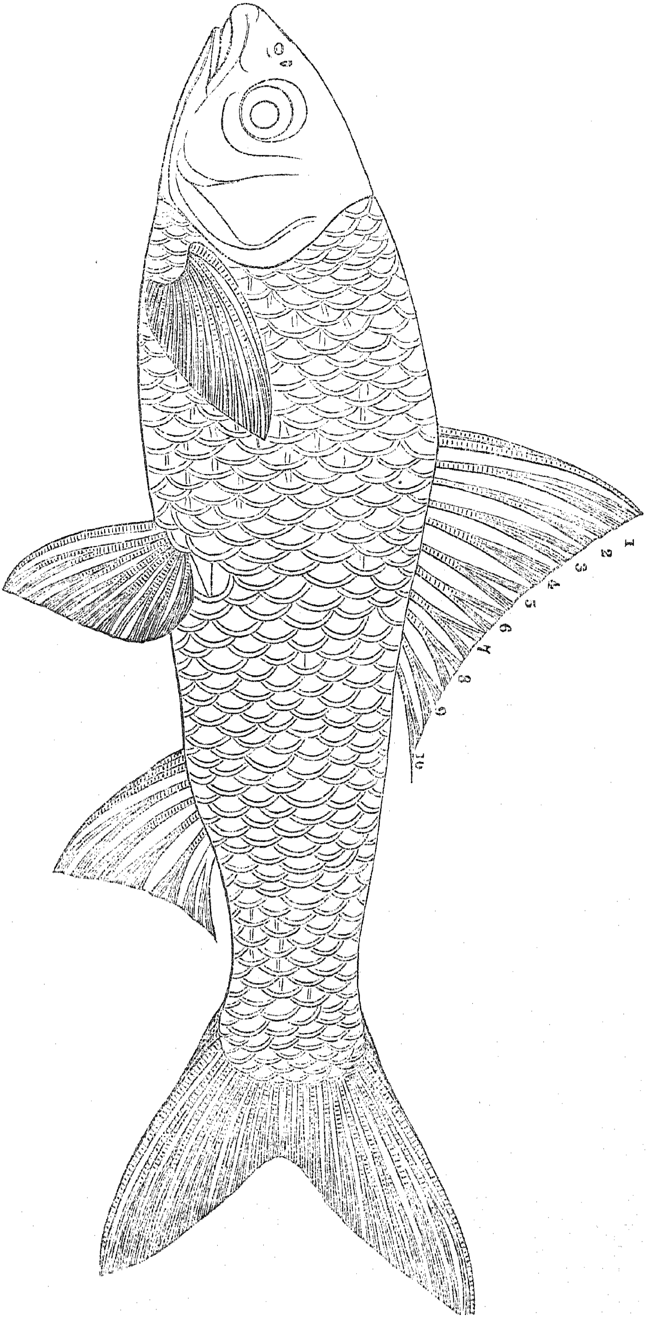
* I preserve all skins of importance in bottles to insure their greater safety.



24th Cyprinus Bata

discovered by Mr. Day, and shall defer further observations until I have had an opportunity of examining this document.

With regard to Mr. Day's observations regarding the value of some genera adopted in the 'Catalogue of Fishes,' but questioned by him, I must decline to enter into controversy with him. It is very natural that an author who has to work out the entire field of ichthyology should be guided in this respect by different considerations and hold different views from one who limits himself to a fauna; and as long as Mr. Day introduces into his papers statements of the kind mentioned above, I feel that, for the future, it will be undesirable to employ my time in taking notice of similar communications to the Society.

APPENDIX.

LIST OF ADDITIONS TO THE SOCIETY'S MENAGERIE DURING THE YEAR

1871.

Jan. 1. 2 Black Apes (*Cynopithecus niger*), ♂. Celebes. Purchased.
2 Bornean Apes (*Macacus maurus*), ♂ and ♀. Borneo. Purchased.
1 Ashy-black Ape (*Macacus ocreatus*), ♂. Celebes. Purchased.
1 Tayra (*Galera barbara*). Interior of New Granada. Purchased.
4. 1 Indian Kite (*Milvus govinda*). Presented by Henry Markmann, Esq.
5. 1 Giraffe (*Camelopardus giraffa*), ♂. Purchased.
1 Painted Partridge (*Francolinus pictus*). Central India. Presented by Lieut.-Col. Radcliffe.
6. 1 Hybrid Cat (between *Felis catus* and *F. domestica*), ♂. Presented by S. E. B. Pusey, Esq., F.Z.S.
1 Alpine Marmot (*Arctomys marmotta*). Presented by Professor Herschel, B.A.
2 Common Paradoxures (*Paradoxurus typus*). Received in exchange.
9. 1 Alligator (*Alligator mississippiensis*). Presented by H.R.H. the Prince of Wales, F.Z.S.
10. 2 Gaimard's Kangaroos (*Bettongia gaimardi*). Presented by G. E. Thompson, Esq.
1 Nicobar Pigeon (*Calœnas nicobarica*). Deposited by John Fleming, Esq.
11. 1 Two-toed Sloth (*Cholœpus didactylus*). Demerara. Presented by Capt. J. S. Hamlyn.
1 Levaillant's Cynictis (*Cynictis levaillantii*). Purchased.
1 Cirl Bunting (*Emberiza cirlus*). Purchased.
14. 1 Grey Ichneumon (*Herpestes griseus*). Received in exchange.
17. 1 Himalayan Bear (*Ursus tibetanus*), ♀. Presented by Capt. Lyon.
2 Roach (*Leuciscus rutilus*). Presented by Ashley Dodd, Esq., F.Z.S.
3 Common Perch (*Perca fluviatilis*). Presented by Ashley Dodd, Esq., F.Z.S.
21. 1 Javan Chevrotain (*Tragulus javanicus*). Presented by S. M. Soutter, Esq.
24. 1 Ground-Parrot (*Strigops habroptilus*). Deposited by Capt. R. Peek.

Jan. 26. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Presented by Madame Richards.
1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Madame Richards.
1 Grand Galago (*Galago crassicaudata*). Purchased.
28. 1 Macaque Monkey (*Macacus cynomolgus*). Deposited by J. Kilching, Esq.
29. 2 Derbian Screamers (*Chauna derbiana*). Cartagena. Purchased.
1 Annulated Snake (*Leptodira annulata*). Panama. Purchased.
30. 2 Splendid Grass-Parrakeets (*Euphema splendida*), ♂ and ♀. Purchased.

Feb. 2. 1 Summer Duck (*Aix sponsa*), ♀. Purchased.
1 Spotted Ichneumon (*Herpestes auropunctatus*). Bengal. Purchased.
3. 1 Black Saki (*Pithecia satanas*), ♀. Purchased.
1 White-collared Mangabey (*Cercocebus collaris*), ♂. Purchased.
2 Coal-Tortoises (*Testudo carbonaria*). Purchased.
1 Peregrine Falcon (*Falco peregrinus*). Island of Lewis, W. Hebrides. Presented by H. Stone, Esq.
6. 1 Ring-necked Parrakeet (*Palæornis torquata*), ♀. Presented by Major Sharples.
1 Green Monkey (*Cercopithecus callitrichus*), ♂. Deposited by Major Graham.
13. 1 Kusimanse (*Crossarchus obscurus*), ♀. Purchased.
1 Lesser White-nosed Monkey (*Cercopithecus petaurista*), ♂. Purchased.
1 Brazilian Tortoise (*Testudo tabulata*). Received in exchange.
1 Senegal Touracou (*Corythaix persa*). Purchased.
1 Bristly Ground-Squirrel (*Xerus setosus*). Purchased.
2 Talapoin Monkeys (*Cercopithecus talapoin*), ♀. Purchased.
14. 2 pairs of Pied Grass-Finches (*Spermestes fringilloides*). Purchased.
17. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Joshua Duke, Esq.
20. 1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Born in the Menagerie.
1 Vervet Monkey (*Cercopithecus lalandi*), ♀. Presented by T. Hooby, Esq.
21. 1 Hippopotamus (*Hippopotamus amphibius*), ♂. Born in the Menagerie.
1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by G. Cole, Esq.
1 Red-fronted Lemur (*Lemur rufifrons*), ♂. Purchased.
22. 1 Gaimard's Rat-Kangaroo (*Bettongia grayi*). Born in the Menagerie.
1 Wild Boar (*Sus scrofa*), ♂. Mesopotamia. Presented by G. Phillips, Esq.
7 Canary Finches (*Crithagra canaria*). Purchased.
24. 1 Philantomba Antelope (*Cephalophus maxwellii*), ♀. Born in the Menagerie.
25. 1 Proteus (*Proteus anguinus*). Cave of Adelsberg. Presented by Henry Syme, Esq.
1 Weeper Capuchin Monkey (*Cebus capucinus*), ♀. Presented by Mrs. Walker.
1 Egyptian Cat (*Felis chaus*), ♀. Purchased.

Feb. 27. 1 Sambur Deer (*Cervus aristotelis*), ♂. Born in the Menagerie.
28. 4 Mulita Armadillos (*Tatusia hybrida*). Born in the Menagerie.

Mar. 2. 1 Chestnut-backed Squirrel (*Sciurus castanonotus*). Acapulco, West Mexico. Presented by Lieut. G. R. Bromley, R.N.
3. 16 Wonga-Wonga Pigeons (*Leucosarcia picata*). Presented by Commodore Lambert, R.N.
4. 3 Senegal Touracous (*Corythaix persa*). Purchased.
6. 2 Ariel Phalangers (*Belideus ariel*), ♀. Port Darwin. Presented by the Directors of the Botanic Gardens, Adelaide, Australia.
1 Vulpine Phalanger (white var.) (*Phalangista vulpina*), ♂. Presented by the Directors of the Botanic Gardens, Adelaide, Australia.
1 Rabbit-eared Perameles (*Perameles lagotis*), ♀. West Australia. Presented by the Directors of the Botanic Gardens, Adelaide, Australia.
1 pair Crimson-winged Parrakeets (*Aprosmictus coccinopterus*). Port Darwin. Presented by the Directors of the Botanic Gardens, Adelaide, Australia.
1 Barred-shouldered Dove (*Geopelia humeralis*). Presented by the Directors of the Botanic Gardens, Adelaide, Australia.
1 Australian Quail (*Synœcus australis*). Presented by the Directors of the Botanic Gardens, Adelaide, Australia.
1 Musanga Paradoxure (*Paradoxurus musanga*), ♂. Timor. Presented by P. E. Warburton, Esq., R.N.
1 Great Kangaroo (*Macropus giganteus*). Born in the Menagerie.
1 Zebu (*Bos indicus*). Born in the Menagerie.
7. 2 Llamas (*Lama peruana*). Presented by His Grace the Duke of Wellington, F.Z.S.
8. 1 Temminck's Snapper (*Macroclemmys temminckii*). Purchased.
10. 2 Cinereous Benghalis (*Estrelda cærulescens*). Purchased.
11. 2 Rose-Hill Parrakeets (*Platycercus eximius*). Purchased.
2 Moor Monkeys (*Semnopithecus maurus*). Java. Presented by Capt. D. Nutsford.
13. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Dr. N. Holland.
14. 2 Javan Chevrotains (*Tragulus javanicus*), ♂ and ♀. Presented by G. W. T. Browne, Esq.
2 White-eared Bulbuls (*Pycnonotus leucotis*). Purchased.
1 Yellow-winged Conure (*Conurus virescens*). Purchased.
1 Blue-winged Parrakeet (*Brotogerys tiriacula*). Purchased.
15. 4 Crested Ground-Parrakeets (*Calopsitta novæ-hollandiæ*), 2 ♂ and 2 ♀. Presented by A. Grote, Esq., F.Z.S.
1 Javan Porcupine (*Hystrix javanica*). Purchased.
1 Cape Hunting Dog (*Lycaon pictus*), ♂. Purchased.
1 Masked Owl (*Strix personata*). Purchased.
1 Tayra (*Galera babara*). Panama. Purchased.
1 Delicate Iguana (*Iguana delicatissima*). Nicaragua. Purchased.
1 Sharp-nosed Crocodile (*Crocodilus americanus*). Colon, West Indies. Purchased.

Mar. 16. 2 Amherst Pheasants (*Thaumalea amherstiæ*). Purchased.
1 Hybrid Gayal (between *Bos indicus* ♂ and *Bos frontalis* ♀). Born in the Menagerie.
1 Common Eel (white var.) (*Anguilla vulgaris*). Presented by H. Lee, Esq.
20. 1 Vervet Monkey (*Cercopithecus lalandii*), ♂. Presented by W. S. Page, Esq.
21. 2 White-faced Tree-Ducks (*Dendrocygna viduata*). South America. Purchased.
2 Laughing Kingfishers (*Dacelo gigantea*). Deposited by Mrs. Arcedeckne.
1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Deposited by Mrs. Arcedeckne.
1 Mouflon (*Ovis musimon*), ♂. Presented by Her Majesty the Queen.
27. 12 Green Lizards (*Lacerta viridis*). Island of Jersey. Presented by G. E. Maude, Esq.
1 Rook (*Corvus frugilegus*). Deposited by Lady M. Beresford Hope.
28. 1 Turnstone (*Strepsilas interpres*). Presented by Dr. Palin, C.M.Z.S.
1 Virginian Eagle-Owl (*Bubo virginianus*). Purchased.
1 African Civet (*Viverra civetta*), ♂. Quiah, W. Africa. Purchased.
1 Bennett's Wallaby (*Halmaturus bennettii*). Born in the Menagerie.
1 Ibex (*Capra ibex*). Born in the Menagerie.
30. 4 Gold Pheasants (*Thaumalea picta*), ♀. Purchased.
31. 4 Marmoset Monkeys (*Hapale jacchus*), 2 ♂ and 2 ♀. Purchased.
1 Kusimanse (*Crossarchus obscurus*), ♀. Purchased.
1 Coati (black var.) (*Nasua nasica*), ♀. Purchased.
1 Brown Capuchin Monkey (*Cebus apella*), ♂. Purchased.
1 Weeper Capuchin Monkey (*Cebus capucinus*), ♂. Purchased.
1 Mona Monkey (*Cercopithecus mona*), ♀. Purchased.
1 Grand Eclectus (*Eclectus grandis*). Purchased.
2 Javan Parrakeets (*Palæornis javanica*). Purchased.
1 Bronze-Spotted Dove (*Chalcopelia chalcospila*). Purchased.
2 Tambourine Pigeons (*Tympanistria bicolor*), ♂ and ♀. Purchased.
1 Japanese Deer (*Cervus sika*), ♂. Received in exchange.
1 Entellus Monkey (*Semnopithecus entellus*), ♀. Received in exchange.
1 Potto (*Perodicticus potto*). Purchased.

Apr. 1. 1 Little Grebe (*Podiceps minor*). Presented by J. K. Lord, Esq., F.Z.S.
1 Prince Alfred's Deer (*Cervus alfredi*), ♀. Philippine Islands. Received in exchange.
1 Weeper Capuchin Monkey (*Cebus capucinus*), ♂. Purchased.
3. 1 Emu (*Dromæus novæ-hollandiæ*). Presented by Capt. Cruickshank.
4. 1 Squirrel Monkey (*Callithrix sciureus*), ♀. Purchased.
5. 1 Wood Brocket (*Cervus nemorivagus*). Purchased.
1 Capuchin Monkey (*Cebus capucinus*) (?), ♂. Purchased.
1 Capuchin Monkey (*Cebus capucinus*) (?), ♂. Purchased.

Apr. 5. 1 Persian Gazelle (*Gazella subgutturosa*), ♀. Presented by J. R. Mayers, Esq.
6 Fifteen-spined Sticklebacks (*Gasterosteus spinachia*). Presented by W. Penny, Esq.
3 Long-spined Cottus (*Cottus bubalis*). Presented by W. Penny, Esq.
17 Deep-nosed Pipefish (*Syngnathus typhle*). Purchased.
8 Straight-nosed Pipefish (*Syngnathus ophidion*). Purchased.
3 Worm Pipefish (*Syngnathus lumbriciformis*). Purchased.
6. Common Camel (*Camelus dromedarius*), ♀. Purchased.
2 Swainson's Lorikeets (*Trichoglossus swainsonii*). Purchased.
1 Chuva Spider Monkey (*Ateles marginatus*). Purchased.
2 Missel Thrushes (*Turdus viscivorus*). Purchased.
2 Fieldfares (*Turdus pilaris*). Purchased.
2 Redwings (*Turdus iliacus*). Purchased.
7. 1 Barnard's Parrakeet (*Platycercus barnardii*). Purchased.
1 Collared Fruit-Bat (*Cynonycteris collaris*). Born in the Menagerie.
1 Red-billed Tree-Duck (*Dendrocygna autumnalis*). Purchased.
8. 1 Hocheur Monkey (*Cercopithecus nictitans*). Purchased.
10. 1 Chimpanzee (*Troglodytes niger*), ♀. Deposited.
1 Greater White-crested Cockatoo (*Cacatua cristata*). Presented by Major-General Sir B. T. Phillips, F.Z.S.
11. 1 Red-bellied Spider Monkey (*Ateles rufiventris*), ♀. Atrato River. Purchased.
1 Geoffroy's Marmoset Monkey (*Midas geoffroii*), ♀. Panama. Purchased.
1 Kinkajou (*Cercoleptes caudivolvulus*), ♀. Nicaragua. Purchased.
12. 1 Black-billed Parrakeet (*Palæornis melanorhyncha*), ♀. Presented by Edmund Warre, Esq.
20 Salmon (*Salmo salar*). Presented by F. Buckland, Esq., F.Z.S.
20 Swiss Lake-Trout (*Salmo lacustris*). Presented by F. Buckland, Esq., F.Z.S.
30 Bull Trout (*Salmo eriox*). Presented by F. Buckland, Esq., F.Z.S.
13. 4 Nose-horned Vipers (*Vipera nasicornis*). Cape Coast, West Africa. Presented by Wm. Cleaver, Esq.
1 Rat-tailed Serpent (*Trigonocephalus lanceolatus*). St. Lucia, West Indies. Presented by G. W. Des Vœux, Esq., C.M.Z.S.
14. 1 Kiwi (*Apteryx mantelli*). Purchased.
1 Owen's Apteryx (*Apteryx owenii*). Purchased.
1 African Cobra (*Naia haje*). Purchased.
15. 1 Bay Lynx (*Felis rufa*), ♂. Purchased.
3 Madagascar Porphyrios (*Porphyrio madagascariensis*). Purchased.
1 Garnett's Galago (*Galago garnettii*), ♂. Purchased.
16. 1 Brown Capuchin Monkey (*Cebus apella*), ♂. Presented by Percy Frere Luck, Esq.
17. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by W. Vaughan, Esq.
18. 4 Tibetan Wolves (*Canis laniger*). Born in the Menagerie.
19. 1 Boobook Owl (*Athene boobook*). Presented by T. Walker, Esq.
20. 1 Black Wallaby (*Halmaturus ualabatus*), ♀. Born in the Menagerie.

Apr. 20. 1 Black-tailed Water-Hen (*Tribonyx ventralis*). Hatched in the Gardens.
12 Short-nosed Seahorses (*Hippocampus brevirostris*). Purchased.
12 Marbled Newts (*Triton marmoratus*). Purchased.
1 Five-spotted Wrasse (*Crenilabrus quinquemaculatus*). Purchased.
1 Sordid Dragonet (*Callionymus dracunculus*). Purchased.
1 Striped Bream (*Cantharus* jr.). Purchased.
21. 1 Great Kangaroo (*Macropus giganteus*), ♂. Received in exchange.
2 Common Peafowls (*Pavo cristatus*), ♀. Purchased.
1 Black-winged Peafowl (*Pavo nigripennis*), ♀. Purchased.
2 Stock-Doves (*Columba œnas*). Presented by Wm. Bankes, Esq.
22. 1 Swainson's Lorikeet (*Trichoglossus swainsonii*). Presented by Miss C. Wale.
2 Scaly-breasted Parrakeets (*Trichoglossus chlorolepidotus*). Presented by Miss C. Wale.
23. 3 Upland Geese (*Chloëphaga magellanica*). Hatched in the Gardens.
24. 1 Short-headed Phalanger (*Belideus breviceps*), ♂. Presented by C. E. Booth, Esq.
2 Philippine Hanging Parrakeets (*Loriculus culacissi*). Purchased.
1 Blue-crowned Parrakeet (*Tanygnathus luconensis*). Purchased.
25. 3 Bladder-nosed Seals (*Cystophora cristata*). Purchased.
26. 1 Golden Conure (*Conurus luteus*). Purchased.
1 Malabar Pastor (*Pastor malabarica*). Purchased.
27. 1 Capybara (*Hydrochœrus capybara*). Purchased.
3 Jerboas (*Dipus ægyptius*). Born in the Menagerie.
28. 1 Syrian Wild Ass (*Equus hemippus*), ♂. Deposited by H. J. Sedway, Esq.
1 Rhesus Monkey (*Macacus erythræus*), ♂. Deposited by R. Allison, jun., Esq., F.Z.S.
29. 1 Pole-Cat (*Mustela putorius*), ♀. Presented by C. Wedge, Esq.
1 Australian Sheldrake (*Tadorna tadornoides*). Purchased.
30. 7 Cyclodus Lizards (*Cyclodus gigas*). Born in the Menagerie.

May 1. 2 Derbian Wallabies (*Halmaturus derbianus*), ♂. Born in the Menagerie.
1 Brazilian Hang-nest (*Icterus jamaicai*). Purchased.
2. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Malay countries. Presented by G. Wingfield, Esq.
1 Harmless Coral Snake (*Erythrolamprus venustissimus*). Presented by Dr. Chyne.
3. 2 Egyptian Geese (*Chenalopex ægyptiaca*). Hatched in the Gardens.
3 Blackish Sternotheres (*Sternothærus subniger*). Madagascar. Purchased.
2 Grey Ichneumons (*Herpestes griseus*), ♂. Purchased.
1 Bennett's Wallaby (*Halmaturus bennettii*), ♀. Presented by C. J. Brownrigg, Esq.
4. 1 Emu (*Dromæus novæ-hollandiæ*), ♂. Presented by Miss Beatson.
1 Chimpanzee (*Troglodytes niger*), ♀. Deposited.

May 4. 2 Vieillot's Pheasants (*Euplocamus vieilloti*), ♂ and ♀. Deposited.
1 Ungko Gibbon (*Hylobates variegatus*), ♀. Deposited.
1 Purple-faced Monkey (*Semnopithecus cephalopterus*), ♀. Ceylon. Purchased.
2 White-eared Fruit-Bats (*Cynopterus marginatus*), ♂ and ♀. Purchased.
2 Himalayan Marmots (*Arctomys bobac*). Bhootan. Purchased.
2 Chinese Jay Thrushes (*Garrulax chinensis*). Purchased.
1 Siamese Magpie (*Urocissa magnirostris*). Purchased.
2 Blue-throated Barbets (*Megalæma asiatica*). Purchased.
2 Hunting Crows (*Cissa venatoria*). Purchased.
1 Blue-thighed Lory (*Lorius tibialis*). Purchased.
2 Blue-breasted Lories (*Eos indica*). Purchased.
1 Mitchell's Lorikeet (*Trichoglossus mitchelli*). Purchased.
3 Crowned Partridges (*Rollulus coronatus*), 2 ♂ and 1 ♀. Purchased.
4 Black-throated Hill Partridges (*Arboricola torqueola*), 2 ♂ and 2 ♀. Purchased.
2 Grey Francolins (*Francolinus ponticerianus*), ♂ and ♀. Purchased.
1 Long-billed Francolin (*Rhizothera longirostris*). Purchased.
2 Yellow-spotted Terrapens (*Clemmys hamiltoni*). Allahabad, India. Purchased.
2 Dura Terrapins (*Pangshura tentorium*). Allahabad, India. Purchased.
1 Thurgi Terrapin (*Clemmys thurgi*). Allahabad, India. Purchased.
5. 1 Wood Brocket (*Cervus nemorivagus*), ♀. Purchased.
2 Beautiful Parrakeets (*Psephotus pulcherrimus*), ♂ and ♀. Purchased.
4 Chestnut-eared Finches (*Amadina castanotis*), 2 ♂ and 2 ♀. Purchased.
1 Garnett's Galago (*Galago garnettii*), ♂. Port Natal. Purchased.
1 Monteiro's Galago (*Galago monteiri*), ♂. Angola. Purchased.
6. 2 Common Buzzards (*Buteo vulgaris*). Presented by W. Brodrick, Esq.
7. 1 Chimpanzee (*Troglodytes niger*), ♂. Presented by J. J. Monteiro, Esq., C.M.Z.S.
1 Bell's Cinixys (*Cinixys belliana*). Presented by J. J. Monteiro, Esq., C.M.Z.S.
8. 3 Slow Worms (*Anguis fragilis*). Presented by Dr. Bowerbank, F.Z.S.
4 Common Snakes (*Tropidonotus natrix*). Presented by Dr. Bowerbank, F.Z.S.
1 Bronze-winged Pigeon (*Phaps chalcoptera*). Deposited by the Rev. C. Cooke.
1 White-bellied Sea-Eagle (*Haliaëtus leucogaster*). Deposited by the Duke of Buckingham and Chandos.
9. 1 Black-fronted Lemur (*Lemur nigrifrons*). Born in the Menagerie.
2 Polish Swans (*Cygnus immutabilis*), ♂ and ♀. Received in exchange.
1 Brown Capuchin Monkey (*Cebus apella*). Deposited by Mrs. Harrison.

May 10. 1 Anoa (*Bubalus depressicornis*), ♂. Purchased.
1 Common Peafowl (*Pavo cristatus*), ♂. Presented by Sir Thos. Dyer, Bart.
2 Black-winged Peafowls (*Pavo nigripennis*), ♂ and ♀. Presented by Sir Thos. Dyer, Bart.
11. 1 Nose-horned Viper (*Vipera nasicornis*). Cape Coast, West Africa. Presented by H.E. Governor Ussher.
1 River-Jack (*Vipera rhinoceros*). Cape Coast, West Africa. Presented by C. B. Mosse, Esq.
1 Imperial Eagle (*Aquila imperialis*). Foo-Chow, China. Purchased.
12. 1 Bennett's Wallaby (*Halmaturus bennettii*), ♀. Born in the Menagerie.
1 Dunlin (*Tringa variabilis*). Presented by J. E. Harting, Esq., F.Z.S.
13. 2 Guinea Baboons (*Cynocephalus papio*), ♂. Presented by Wm. Burrows, Esq.
6 North-African Jackals (*Canis anthus*). Born in the Menagerie.
4 Brent Geese (*Bernicla brenta*), 2 ♂ and 2 ♀. Purchased.
15. 1 Common Buzzard (*Buteo vulgaris*). Presented by E. C. Phillips, Esq.
1 Peacock Pheasant (*Polyplectron chinquis*). Hatched in the Gardens.
1 Herring-Gull (*Larus argentatus*). Presented by J. D. Bourdillon, Esq.
16. 1 Western Slender-billed Cockatoo (*Licmetis pastinator*). Presented by Mrs. Lesser.
2 Chilian Swans (*Cygnus coscoroba*), ♂ and ♀. Chili. Purchased.
2 Andean Geese (*Bernicla melanoptera*), ♂ and ♀. Chili. Purchased.
2 Chilian Starlings (*Curæus aterrimus*). Chili. Purchased.
4 Buenos-Ayres Cow-birds (*Molothrus bonariensis*), 2 ♂ and 2 ♀. Mendoza. Purchased.
5 Rufescent Teguexins (*Teius rufescens*). Mendoza. Purchased.
2 Dominican Gulls (*Larus dominicanus*). Chili. Purchased.
2 Long-winged Milvagos (*Milvago megalopterus*). Chili. Purchased.
1 Long-haired Armadillo (*Dasypus vellerosus*). Mendoza. Purchased.
1 Spectacled Bear (*Ursus ornatus*). Andes of Peru. Purchased.
17. 2 Ruddy Sheldrakes (*Tadorna rutila*). Hatched in the Gardens.
1 Common Adder (*Pelias berus*). Styria. Received in exchange.
2 Green Lizards (*Lacerta viridis*). Received in exchange.
5 Glass Snakes (*Pseudopus pallasii*). Received in exchange.
3 Horned Cerastes (*Vipera cerastes*). Received in exchange.
1 Weeper Capuchin Monkey (*Cebus capucinus*). Deposited by Capt. Giffard.
2 Proteus (*Proteus anguinus*). Cave of Adelsburg. Presented by W. C. P. Medlycott, Esq., F.Z.S.
18. 5 Kingfishers (*Alcedo ispida*). Purchased.
1 Mexican Deer (*Cervus mexicanus*). Born in the Gardens.
1 Axis Deer (*Cervus axis*), ♀. Deposited by Thos. Wright, Esq.
1 Long-eared Owl (*Otus vulgaris*). Purchased.
1 Hybrid Mouflon (between *Ovis cycloceros* ♂ and *O. musimon* ♀). Born in the Menagerie.

May 18. 1 Wild Cat (*Felis catus*). Deposited by the Duke of Sutherland, F.Z.S.
20. 1 Kiwi (*Apteryx mantellii*). Presented by Alfred Lafone, Esq.
1 Snow Bunting (*Plectrophanes nivalis*). Presented by Fred. Bond, Esq., F.Z.S.
2 Ortolan Buntings (*Emberiza hortulana*). Presented by Fred. Bond, Esq., F.Z.S.
23. 3 Sandwich-Island Geese (*Chloëphaga sandvicensis*). Hatched in the Gardens.
1 Pennant's Parrakeet (*Platycercus pennantii*). Deposited by Lady Cust.
1 Common Kestrel (*Tinnunculus alaudarius*). Presented by G. W. Obicini, Esq.
25. 1 Merlin (*Falco æsalon*). Presented by Joseph Wolf, Esq., F.Z.S.
26. 7 Temminck's Tragopans (*Ceriornis temminckii*). Hatched in the Gardens.
1 Peacock Pheasant (*Polyplectron chinquis*). Hatched in the Gardens.
1 Sun-bird (*Eurypyga helias*). Hatched in the Gardens.
1 Spotted Ichneumon (*Herpestes auropunctatus*), ♂. Presented by Mr. W. H. Scratton.
1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Miss Kerr.
27. 1 Maltese Snake (*Zamenis atrovirens*). Malta. Presented by C. A. Wright, Esq.
29. 1 Vervet Monkey (*Cercopithecus lalandii*), ♀. Presented by J. C. Lawrence, Esq.
1 Tamandua Ant-eater (*Tamandua tetradactyla*). Santa Martha. Purchased.
2 Short-tailed Capromys (*Capromys brachyura*). Purchased.
1 Hybrid Mouflon (between *Ovis cycloceros* ♂ and *O. musimon* ♀). Born in the Menagerie.
30. 1 Gray's Jerboa Kangaroo (white var.) (*Bettongia grayi*), ♂. Presented by C. Moore, Esq., C.M.Z.S.
2 Wood-hen Rails (*Ocydromus sylvestris*). Lord Howe's Island. Presented by Dr. G. Bennett, F.Z.S.
31. 1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Presented by Rev. H. Fyffe.
2 Red-bellied Kangaroos (*Halmaturus billardieri*), ♂ and ♀. Received in exchange.
1 Canadian Lynx (*Felis canadensis*). Upper Canada. Presented R. Carington, Esq., F.Z.S.

June 1. 2 Senegal Parrots (*Pœocephalus senegalensis*). Purchased.
1 Banded Ichneumon (*Herpestes fasciatus*), ♂. Purchased.
6 Summer Ducks (*Aix sponsa*). Hatched in the Gardens.
2. 2 Black-headed Parrots (*Caica melanocephala*). Demerara. Deposited by Mrs. L. M. Rate.
3. 3 Trumpeter Swans (*Cygnus buccinator*). Hatched in the Gardens.
1 Indian Elephant (*Elephas indicus*), ♂. Deposited by H.R.H. Duke of Edinburgh, F.Z.S.
1 Grison (*Grisonia vittata*), ♂. Presented by H.R.H. Duke of Edinburgh, F.Z.S.

June 3. 1 Domestic Goat (*Capra hircus*), ♀. Presented by H.R.H. Duke of Edinburgh, F.Z.S.

1 Black-cheeked Falcon (*Falco melanogenys*). Presented by H.R.H. Duke of Edinburgh, F.Z.S.

5. 1 Hog Deer (*Cervus porcinus*), ♀. Born in the Menagerie.

1 Javan Pea-fowl (*Pavo muticus*). Burmah. Purchased.

3 Dwarf Chameleons (*Chamæleon pumilus*). Presented by F. H. Smith, Esq.

6. 1 Crested Curassow (*Crax alector*). Presented by Mr. J. Stanton.

2 Common Snakes (*Tropidonotus natrix*, var.). Dalmatia. Purchased.

3 Lacertine Snakes (*Cœlopeltis lacertina*). Dalmatia. Purchased.

2 Long-nosed Vipers (*Vipera ammodytes*). Dalmatia. Purchased.

4 Dark-green Snakes (*Zamenis atrovirens*). Dalmatia. Purchased.

2 Æsculapian Snakes (*Coluber æsculapii*). Dalmatia. Purchased.

7. 1 Grey Ichneumon (*Herpestes griseus*). Presented by W. Hearsey, Esq.

8 Chiloe Wigeon (*Mareca chiloensis*). Hatched in the Gardens.

8. 1 Blackish Sternothere (*Sternothærus subniger*). Madagascar. Purchased.

9. 1 Red-bellied Squirrel (*Sciurus hypopyrrhus*). Vera Cruz. Purchased.

1 Grison (*Grisonia vittata*), ♀. Purchased.

1 Necklaced Pigeon (*Columba speciosa*). Purchased.

1 Chaffinch (*Fringilla cœlebs*). Presented by Mr. J. G. Keulemans.

10. 2 Aldabran Doves (*Turtur aldabranus*). Presented by E. Newton, Esq., C.M.Z.S.

1 Sacred Ibis (*Geronticus æthiopicus*). Cape Colony. Presented by His Excellency Sir H. Barkly, K.C.B.

11. 3 Impeyan Pheasants (*Lophophorus impeyanus*). Hatched in the Gardens.

7 Hybrid Yellow-billed Ducks. Hatched in the Gardens.

12. 1 Grivet Monkey (*Cercopithecus griseo-viridis*), ♂. Presented by Mrs. Vaughan.

1 Red-footed Douracouli (*Nyctipithecus rufipes*), ♀. Nicaragua. Purchased.

13. 1 African Leopard (*Felis leopardus*), ♂. Presented by H. C. Hardy, Esq.

1 Wood-Owl (*Syrnium aluco*). Presented by Mrs. Buckland.

1 Alligator (*Alligator mississippiensis*). New Orleans. Presented by Capt. J. Rose.

14. 1 Markhoor (*Capra megaceros*), ♂. Born in the Menagerie.

1 Sparrow-Hawk (*Accipiter fringillarius*). Norway. Presented by T. Tax, Esq.

16. 1 Turquosine Parrakeet (*Euphema pulchella*), ♂. Purchased.

1 Grey-breasted Conure (*Conurus monachus*). Monte Video. Presented by M. A. Carr, Esq.

1 Nisnas Monkey (*Cercopithecus pyrrhonotus*), ♀. Nubia. Presented by Col. the Hon. P. Fielding.

17. 1 Ocelot (*Felis pardalis*), ♂. Paraguay. Presented by George Wilks, Esq., C.M.Z.S.

June 17. 2 Geoffroy's Terrapins (*Platemys geoffroyana*). Buenos Ayres. Presented by Geo. Wilks, Esq., C.M.Z.S.

1 Brazilian Caracara (*Polyborus brasiliensis*). Presented by Dr. Palin, C.M.Z.S.

2 Mogadore Gulls (young) (*Larus fuscescens?*). Presented by F. Bond, Esq., F.Z.S.

19. 1 Canadian Beaver (*Castor canadensis*). Born in the Menagerie.

20. 2 Crested Ground - Parrakeets (*Calopsitta novæ-hollandiæ*). Hatched in the Gardens.

21. 1 Green-cheeked Amazon (*Chrysotis viridigenalis*). Purchased.

22. 1 Common Rhea (*Rhea americana*). Argentine Republic. Presented by W. C. Barnes, Esq.

23. 1 Pallas's Paradoxure (*Paradoxurus pallasii*). Purchased.

1 Cuvier's Podargus (*Podargus cuvieri*). Purchased.

24. 3 Imperial Eagles (*Aquila imperialis*). Southern Spain. Presented by Major Howard Irby.

1 Spanish Ichneumon (*Herpestes widdringtoni*). Southern Spain. Presented by Major Howard Irby.

25. 2 Purple Herons (*Ardea purpurea*). Presented by F. Bond, Esq., F.Z.S.

26. 1 Greater Spotted Woodpecker (*Picus major*). Presented by F. Bond, Esq., F.Z.S.

1 Alligator (*Alligator mississipiensis*). Florida. Presented by Miss Peters.

4 Swift Lorikeets (*Lathamus discolor*). Purchased.

1 Passerine Owl (*Athene passerina*). Deposited.

1 Grizzled Spider Monkey (*Ateles grisescens*). Cartagena. Purchased.

1 Black-faced Spider Monkey (*Ateles ater*). Cartagena. Purchased.

1 White-throated Sapajou (*Cebus hypoleucus*). Cartagena. Purchased.

2 Red-bellied Squirrels (*Sciurus hypopyrrhus*). Purchased.

1 Spotted Cavy (*Cœlogenys paca*). Panama. Purchased.

1 Leopard Tortoise (*Testudo pardalis*). Purchased.

8 Bull Frogs (*Rana mugiens*). Presented by J. H. Thomson, Esq., C.M.Z.S.

27. 6 Mandarin Ducks (*Aix galericulata*). Hatched in the Gardens.

1 Tamandua Ant-eater (*Tamandua tetradactyla*). Purchased.

1 Diademed Amazon (*Chrysotis diademata*). Purchased.

28. 3 Temminck's Tragopans (*Ceriornis temminckii*). Hatched in the Gardens.

1 Ducorps's Cockatoo (*Cacatua ducorpsii*). Presented by C. Turner, Esq.

29. 1 Pluto Monkey (*Cercopithecus pluto*). Purchased.

1 Arctic Fox (*Canis lagopus*). Deposited.

1 Great Grey Shrike (*Lanius excubitor*). Presented by F. Bond, Esq., F.Z.S.

1 Crested Pigeon (*Ocyphaps lophotes*). Hatched in the Gardens.

July 2. 1 Japanese Deer (*Cervus sika*). Born in the Menagerie.

4. 1 Great Grey Shrike (*Lanius excubitor*). Presented by — Mitford, Esq.

1 Wood-Owl (*Syrnium aluco*). Presented by Mrs. Buckland.

1 Common Lobster (*Homarus vulgaris*). Presented by Mr. Pearce.

July 4. 1 Naked-eared Squirrel Monkey (*Saimaris usta*). Deposited by Mr. Sutton.
5. 1 White Stork (*Ciconia alba*). Presented by F. M. Hayward, Esq.
6. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Rev. Wm. Hutchinson.
7. 1 Brown Bear (*Ursus arctos*). Presented by C. Czarnikow, F.Z.S.
1 Graceful Ground-Dove (*Geopelia cuneata*). Hatched in the Gardens.
10. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Presented by J. Ayling, Esq.
11. 4 Horned Lizards (*Phrynosoma cornutum*). Galveston, Texas. Presented by A. Sachtleben, Esq.
7 Undulated Grass-Parrakeets (*Melopsittacus undulatus*). Deposited by Dr. Brehm.
2 Stump-tailed Lizards (*Trachydosaurus rugosus*). Deposited by Dr. Brehm.
3 Daubenton's Curassows (*Crax daubentoni*), 1 ♂ and 2 ♀. Venezuela. Presented by A. Warmington, Esq.
13. 1 Common Buzzard (*Buteo vulgaris*). Deposited by J. H. Gurney, Esq., F.Z.S.
2 Temminck's Tragopans (*Ceriornis temminckii*). Hatched in the Gardens.
14. 2 Spotted Hyænas (*Hyæna crocuta*). Born in the Menagerie.
1 Chimpanzee (*Troglodytes niger*), ♂. Deposited by Mr. C. Jamrach.
1 Sooty Monkey (*Cercocebus fuliginosus*), ♂. Presented by E. Atkinson, Esq.
2 White-eared Conures (*Conurus leucotis*). Purchased.
15. 2 Wood-Owls (*Syrnium aluco*). Presented by the Rev. A. C. Harvey.
1 Yellow-shouldered Amazon (*Chrysotis ochroptera*). Trinidad. Deposited by the Hon. A. H. G. Gordon, C.M.Z.S.
1 Common Cuckoo (*Cuculus canorus*). Presented by H. J. B. Hancock, Esq., F.Z.S.
1 Common Sturgeon (*Acipenser sturio?*). Presented by Mr. T. Charles.
17. 1 African Leopard (*Felis leopardus*), ♂. Deposited by Lord Ruthven, F.Z.S.
1 Chimpanzee (*Troglodytes niger*), ♂. Deposited by Lord Ruthven, F.Z.S.
18. 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by T. Fenn, Esq.
1 Green Monkey (*Cercopithecus callitrichus*), ♂. Received in exchange.
1 Hog Deer (*Cervus porcinus*, var.), ♂. Ceylon. Presented by E. H. Holdsworth, Esq., F.Z.S.
1 Cheela (*Spilornis cheela*). Ceylon. Presented by E. H. Holdsworth, Esq., F.Z.S.
2 Spur-Fowl (*Galloperdix zeylonensis*), ♂ and ♀. Ceylon. Presented by E. H. Holdsworth, Esq., F.Z.S.
4 Indian Crows (*Corvus splendens*). Ceylon. Presented by E. H. Holdsworth, Esq., F.Z.S.
1 Russell's Viper (*Vipera russellii*). Ceylon. Presented by E. H. Holdsworth, Esq., F.Z.S.
19. 1 Long-nosed Crocodile (*Crocodilus cataphractus*). Purchased.

July 20. 1 Silvery Gibbon (*Hylobates leuciscus* ?), ♀. Purchased.
2 Brown Capuchin Monkeys (*Cebus apella*), ♂. Deposited by Mr. G. Fulgoni.
1 One-streaked Hawk (*Melierax monogrammicus*). Purchased.
1 Crested Peacock Pheasant (*Polyplectron bicalcaratum*), ♂. Received in exchange.
21. 2 Hybrid Pheasants (between *Thaumalea amherstiæ* ♂ and *T. picta* ♀), ♂. Deposited by John J. Stone, Esq., F.Z.S.
1 Passerine Owl (*Athene passerina*). Presented by the Rev. J. Climenson, F.Z.S.
22. 6 Dorsal Squirrels (*Sciurus dorsalis*). Nicaragua. Purchased.
3 Undulated Grass Parrakeets (*Melopsittacus undulatus*). Presented by Thos. Lupton, Esq.
23. 1 Common Seal (*Phoca vitulina*), ♂. Presented by Mr. Beard.
1 Red-backed Shrike (*Lanius collurio*). Purchased.
1 Land Rail (*Crex pratensis*). Purchased.
24. 2 Common Turtles (*Chelonia viridis*). Presented by Joshua Duke, Esq.
1 Common Turtle (*Chelonia viridis*). Presented by Joshua Duke, Esq.
3 Goshawks (*Astur palumbarius*). Norway. Presented by Reginald James, Esq.
3 Common Genets (*Genetta vulgaris*). Prov. of Traz os Montes, Portugal. Presented by J. P. Gassiot, Esq., jun., F.Z.S.
25. 1 Mexican Deer (*Cervus mexicanus*). St. Croix. Presented by R. B. Lambe, Esq.
1 Chacma Baboon (*Cynocephalus porcarius*). Presented by Joshua Duke, Esq.
1 Wood-Wren (*Phylloscopus sibilatrix*). Presented by J. Young, Esq.
1 Willow Warbler (*Phylloscopus rufus*). Presented by J. Young, Esq.
26. 1 Canadian Beaver (*Castor canadensis*). Born in the Menagerie.
1 Blue-and-Yellow Maccaw (*Ara ararauna*). Presented by C. Butler, Esq., F.Z.S.
1 Blue-and-Yellow Maccaw (*Ara ararauna*). Deposited by C. Butler, Esq., F.Z.S.
1 Hocheur Monkey (*Cercopithecus nictitans*). Purchased.
1 White-throated Sapajou (*Cebus hypoleucus*). Purchased.
1 Brown Capuchin Monkey (*Cebus apella*). Purchased.
27. 1 Black-faced Kangaroo (*Macropus melanops*). Born in the Menagerie.
1 Sun-bird (*Eurypyga helias*). Hatched in the Gardens.
1 Ring-necked Parrakeet (*Palæornis torquata*). Presented by Miss Ouchtulony.
2 Hawk's-billed Turtles (*Chelone imbricata*). Honduras. Purchased.
28. 1 Laughing Kingfisher (*Dacelo gigantea*). Presented by E. E. M. Royds, Esq.
29. 1 Eroded Cinixys (*Cinixys erosa*). Purchased.
31. 1 Common Kestrel (*Tinnunculus alaudarius*). Presented by W. Lund, Esq.

Aug. 1. 1 Coati (*Nasua nasica*), ♀. Presented by Mrs. Buckland.
2 Whin-Chats (*Sylvia rubetra*). Purchased.

Aug. 1. 1 Pied Wagtail (*Motacilla yarrelli*). Purchased.
1 Sykes's Monkey (*Cercopithecus albogularis*), ♀. Purchased.
1 Turquoisine Parrakeet (*Euphema pulchella*), ♀. Purchased.
10 Chameleons (*Chamæleon vulgaris*). Purchased.
2 Rollers (*Coracias garrula*). Purchased.
1 Loggerhead Turtle (*Thalassochelys caouana*). Presented by Mr. Villebois.
2. 4 Pantherine Toads (*Bufo pantherinus*). Purchased.
1 Tigrine Genet (*Genetta tigrina*), ♂. Purchased.
1 Brazilian Tortoise (*Testudo tabulata*). Purchased.
2 Domestic Sheep (*Ovis aries*, var.?), ♂ and ♀. West Coast of Africa. Presented by J. J. Monteiro, Esq., C.M.Z.S.
4. A group of Snowy Actiniæ (*Sagartia nivea*). Presented by Dr. Dempsey.
5. 2 Baltimore Orioles (*Icterus baltimorensis*), ♂. Received in exchange.
1 Purple-headed Glossy Starling (*Lamprocolius auratus*). Hatched in the Gardens.
1 Grey Parrot (*Psittacus erithacus*). Deposited by M. Molyneux, Esq.
7. 1 Ludio Monkey (*Cercopithecus ludio*), ♀. Deposited by Col. Anderson.
1 Silky Monkey (*Hapale rosalia*), ♀. Purchased.
1 Tamandua Ant-eater (*Tamandua tetradactyla*). Purchased.
4 Bare-faced Fruit-Pigeons (*Treron calva*). Purchased.
1 Egyptian Monitor (*Monitor niloticus*). Purchased.
1 Common Curlew (*Numenius arquatus*). Presented by J. Kennerd, Esq.
8. 2 Great Kangaroos (*Macropus giganteus*), ♂. Deposited by E. H. Ellis, Esq.
1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Deposited by E. H. Ellis, Esq.
1 Brush Turkey (*Talegalla lathami*), ♀. Deposited by E. H. Ellis, Esq.
1 White-bellied Sea-Eagle (*Haliaëtus leucogaster*). Deposited by E. H. Ellis, Esq.
9. 1 Booted Eagle (*Aquila pennata*). Purchased.
2 Smaller Grackles (*Gracula religiosa*). Presented by Alex. Campbell, Esq.
10. 1 Yellow-footed Rock-Kangaroo (*Petrogale xanthopus*), ♂. Born in the Menagerie.
1 Potto (*Perodicticus potto*), ♂. Purchased.
2 Stanleyan Chevrotains (*Tragulus stanleyanus*), ♀. Purchased.
1 Slender-billed Cockatoo (*Licmetis tenuirostris*). Presented by H. R. Abadie, Esq.
11. 1 Greenfinch (*Fringilla chloris*). Purchased.
1 Maholi Galago (*Galago maholi*). Received in exchange.
2 Bonte-bocks (*Damalis pygarga*), ♀. Purchased.
12. 1 Grey-cheeked Monkey (*Cercocebus albigena*), ♀. Purchased.
1 Pluto Monkey (*Cercopithecus pluto*), ♀. Purchased.
1 Red-backed Shrike (*Lanius collurio*). Purchased.
1 Hawfinch (*Coccothraustes vulgaris*), ♂. Purchased.
13. 2 Tigers (*Felis tigris*). Born in the Menagerie.
14. 2 Peruvian Thicknees (*Œdicnemus superciliaris*). Peru. Presented by the Baron de Rivière.

Aug. 14. 3 Horn-nosed Vipers (*Vipera nasicornis*). Cape Coast, W. Africa. Presented by H.E. Governor Ussher and Dr. Mosse, Staff Surgeon.

2 River Jack Viper (*Vipera rhinoceros*). Cape Coast, W. Africa. Presented by H.E. Governor Ussher and Dr. Mosse, Staff Surgeon.

3 Home's Cinixys (*Cinixys homeana*). Cape Coast, W. Africa. Presented by H.E. Governor Ussher and Dr. Mosse, Staff Surgeon.

1 West-African River-Hog (*Potamochœrus penicillatus*), ♂. Cape Coast, W. Africa. Presented by C. S. Salmon, Esq.

15. 1 Baird's Tapir (*Tapirus bairdi*), ♂. Nicaragua. Purchased.

16. 1 Black-tailed Flower-bird (*Anthornis melanura*). Purchased.

18. 1 Vulpine Phalanger (*Phalangista vulpina*), ♀. Born in the Menagerie.

1 Aldabran Dove (*Turtur aldabranus*). Hatched in the Gardens.

2 Tambourine Pigeons (*Tympanistria bicolor*), ♂. Presented by J. W. Wadlee, Esq.

1 Great Kangaroo (*Macropus giganteus*), ♂. Purchased.

20. 1 Crested Pigeon (*Ocyphaps lophotes*). Hatched in the Gardens.

21. 2 Pucras Pheasants (*Pucrasia xanthospila*), ♂ and ♀. Deposited by R. Swinhoe, Esq.

2 Chaffinches (*Fringilla cœlebs*), ♂ and ♀. Purchased.

22. 1 Moustache-Monkey (*Cercopithecus cephus*), ♀. Purchased.

1 Diana Monkey (*Cercopithecus diana*), ♀. Purchased.

1 Wild Cat (*Felis catus*), ♂. Deposited by the Earl of Hopetoun, F.Z.S.

1 New-Zealand Mudfish (*Neochanna apoda*). Presented by the Acclimatization Society of Canterbury, New Zealand.

2 Earle's Weka Rails (*Ocydromus earlei*). North Island, New Zealand. Presented by the Auckland Acclimatization Society.

23. 1 Potto (*Perodicticus potto*), ♀. Presented by A. Swanzy, Esq.

1 Philippine Hanging Parrakeet (*Loriculus culacissi*). Hatched in the Gardens.

1 Greenfinch (*Fringilla chloris*). Purchased.

2 Spotted Owlets (*Athene brama*). Madras. Presented by Ll. Thomas, Esq.

24. 1 Purple-faced Monkey (*Semnopithecus cephalopterus*), ♀. Purchased.

1 Trumpeter Swan (*Cygnus buccinator*), ♀. Received in exchange.

25. 1 Squirrel Monkey (*Callithrix sciureus*), ♂. Deposited by G. J. Gazzana, Esq.

2 Chukar Partridges (*Caccabis chukar*), ♂ and ♀. Presented by R. Waylan, Esq.

26. 1 Blaubock (*Cephalophus pygmæus*), ♀. Presented by F. Pearson, Esq.

1 Rhesus Monkey (*Macacus erythræus*), ♂. Deposited by the Rev. H. Bateman.

2 Coatis (brown variety) (*Nasua nasica*). Born in the Menagerie.

28. 2 Great Frigate Birds (*Fregata aquila*). Central America. Presented by Capt. J. M. Dow, F.Z.S.

1 Black-faced Spider Monkey (*Ateles ater*), ♀. Purchased.

Aug. 28. 1 Blue-and-Yellow Maccaw (*Ara ararauna*). Purchased.
29. 2 Red-faced Weaver Birds (*Foudia erythrops*). Purchased.
1 Poë Honey-eater (*Prosthemadera novæ-hollandiæ*). Presented by Mrs. Bills.
1 Black-and-Yellow Cyclodus (*Cyclodus nigro-luteus*). Presented by Mrs. Bills.
1 Black-backed Porphyrio (*Porphyrio melanotus*). Presented by the Canterbury Acclimatization Society.
31. 1 Indian Wolf (*Canis pallipes*). Presented by Mr. J. Adamson.
1 Radiated Tortoise (*Testudo radiata*). Madagascar. Received in exchange.

Sept. 1. 1 Nonpareil Finch (*Cyanospiza ciris*). Presented by T. Watkins, Esq.
2 Lacertine Snakes (*Cœlopeltis lacertina*). Deposited.
2. 1 Hairy Armadillo (*Dasypus villosus*). Buenos Ayres. On approval.
2 Geoffroy's Marmosets (*Midas geoffroii*). New Granada. Presented by Miss Miller.
3. 1 Chameleon (*Chamæleon vulgaris*). Presented by W. G. Raymond, Esq.
2 Common Toads (*Bufo vulgaris*). Germany. Presented by Mr. F. Coleman.
1 Spotted Salamander (*Salamandra maculosa*). Germany. Presented by Mr. F. Coleman.
2 Alpine Newts (*Triton alpestris*). Germany. Presented by Mr. F. Coleman.
5. 1 Greater Black-backed Gull (*Larus marinus*). Presented by C. A. Reed, Esq.
1 Daubenton's Curassow (*Crax daubentoni*), ♂. Northern Venezuela. Presented by Geo. Hall, Esq.
1 White-crested Guan (*Penelope pipile*), ♂. Presented by Geo. Hall, Esq.
6. 1 Barred Dove (*Geopelia striata*). Presented by Mr. G. Pottier.
2 Sulphur-breasted Toucans (*Ramphastos carinatus*). Purchased.
7. 2 Crested Curassows (*Crax alector*). Guiana. Presented by George Browne, Esq.
8. 1 Javan Fish-Owl (*Ketupa javanensis*). Java. Purchased.
9. 2 Fulvous Tree-Ducks (*Dendrocygna fulva*). Purchased.
1 Red-billed Tree-Duck (*Dendrocygna autumnalis*). Purchased.
1 Common Ferret (*Mustela furo*), ♂. Presented by Mrs. Bay.
11. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by F. Turner, Esq.
3 Green Toads (*Bufo viridis*). Germany. Received in exchange.
34 Brown Mud-Frogs (*Pelobates fuscus*). Germany. Received in exchange.
5 Green Lizards (*Lacerta viridis*). Calabria. Received in exchange.
1 Black-spotted Lizard (*Lacerta nigro-punctata*). Calabria. Received in exchange.
3 Dark-green Snakes (*Zamenis atrovirens*). Calabria. Received in exchange.
2 Common Snakes (*Tropidonotus natrix*, var. *siculus*). Calabria. Received in exchange.

Sept. 12. 2 Black-handed Spider Monkeys (*Ateles melanochir*), ♀. Nicaragua. Purchased.

1 Geoffroy's Marmoset (*Midas geoffroii*), ♂. Darien. Purchased.

1 Black-and-Yellow Snake (*Tretanorhinus nigroluteus*). Isthmus of Panama. Purchased.

1 Common Bunting (*Emberiza miliaria*). Presented by F. Bond, Esq., F.Z.S.

1 Cirl Bunting (*Emberiza cirlus*). Presented by F. Bond, Esq., F.Z.S.

13. 6 Black-backed Porphyrios (*Porphyrio melanotis*). Deposited by Dr. F. von Mueller, C.M.Z.S.

14. 1 Javan Mynah (*Gracula javanensis*). Labuan. Presented by Mrs. Fitzgerald.

15. 5 Undulated Grass Parrakeets (*Melopsittacus undulatus*). Hatched in the Gardens.

2 Reed Warblers (*Calamodyta strepera*). Purchased.

16. 2 Common Turtles (*Chelonia viridis*). Island of Ascension. Presented by H. W. Clarke, R.E.

1 Weeper Capuchin Monkey (*Cebus capucinus*). Purchased.

18. 1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Born in the Menagerie.

19. 1 South-American Flamingo (*Phœnicopterus ignipalliatus*). Buenos Ayres. Presented by Dr. Palin, C.M.Z.S.

1 Downy Owl (*Pulsatrix torquata*). Paraguay. Presented by Don L. Fontana, C.M.Z.S.

4 Maximilian's Terrapins (*Hydromedusa maximiliani*). Buenos Ayres. Presented by Dr. A. Palin, C.M.Z.S.

2 African Cobras (*Naia haje*). Purchased.

1 Black Iguana (*Metopoceros cornutus*). Presented by J. B. Rowe, Esq.

20. 1 Kaup's Cassowary (*Casuarius kaupi*). New Guinea. Received in exchange.

2 Common Boas (*Boa constrictor*). Purchased.

1 Red-faced Spider Monkey (*Ateles paniscus*), ♂. Demerara. Presented by D. M'Gibbon, Esq.

21. 2 Bengal Horned-Owls (*Bubo bengalensis*). Purchased.

6 Short-nosed Sea-Horses (*Hippocampus brevirostris*). Purchased.

22. 1 Common Barn-Owl (*Strix flammea*). Presented by H. J. B. Hancock, Esq., F.Z.S.

25. 1 Marmoset Monkey (*Hapale jacchus*). Pernambuco. Presented by Mr. W. Langridge.

1 Great Sulphur-crested Cockatoo (*Cacatua galerita*). Deposited by S. Sidney, Esq.

26. 1 Lesser Sulphur-crested Cockatoo (*Cacatua sulphurea*). Presented by G. Thornton, Esq.

9 Common Turtles (*Chelonia viridis*). Ascension. Presented by W. Johnson, Esq.

27. 1 Temminck's Tragopan (*Ceriornis temminckii*), ♂. Purchased.

29. 1 Sun-bird (*Eurypyga helias*). Hatched in the Gardens.

30. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Presented by H. C. Dear, Esq.

1 Great Grey Shrike (*Lanius excubitor*). Presented by R. Mitford, Esq.

1 Cretan Ibex (*Capra picta*), ♀. Crete. Presented by T. B. Sandwith, Esq.

Oct. 2. 1 Harpy Eagle (*Thrasaëtus harpyia*). Demerara. Purchased.
2 Grey Wagtails (*Motacilla boarula*). Purchased.
1 Yellow Wagtail (*Motacilla flava*). Purchased.
1 Golden Plover (*Charadrius pluvialis*). Purchased.
3. 1 Hybrid Mouflon (between *Ovis aries*, var., ♂, and *O. musimon*), ♀. Born in the Menagerie.
1 Bull Frog (*Rana mugiens*). Nova Scotia. Presented by A. Downs, Esq., C.M.Z.S.
1 Dusky Toad (*Bufo lentiginosus*). Nova Scotia. Presented by A. Downs, Esq., C.M.Z.S.
6 Grass Snakes (*Cyclophis vernalis*). Presented by A. Downs, Esq., C.M.Z.S.
1 Garter Snake (*Tropidonotus ordinatus*). Nova Scotia. Presented by A. Downs, Esq., C.M.Z.S.
6 Spotted-headed Snakes (*Ischnognathus occipitomaculatus*). Presented by A. Downs, Esq., C.M.Z.S.
3 Punctured Snakes (*Ablabes punctatus*). Presented by A. Downs, Esq., C.M.Z.S.
4. 1 Herring-Gull (*Larus argentatus*). Presented by J. H. Gurney, Esq., F.Z.S.
6 Grey Linnets (*Fringilla linaria*). Purchased.
2 Andean Geese (*Bernicla melanoptera*). Chili. Purchased.
2 Upland Geese (*Chloëphaga magellanica*). Chili. Purchased.
1 Chiloe Wigeon (*Mareca chiloensis*). Chili. Purchased.
2 Chilian Teal (*Querquedula flavirostris*). Chili. Purchased.
2 Pampas Cats (*Felis passerum*). Chili. Purchased.
1 Spectacled Bear (*Ursus ornatus*). Andes of Peru. Purchased.
1 Chilian Swan (*Cygnus coscoroba*). Chili. Purchased.
6. 2 Crested Pigeons (*Ocyphaps lophotes*). Hatched in the Gardens.
1 Scarlet Ibis (*Ibis rubra*). Deposited by Miss Attwood.
1 Sun-bird (*Eurypyga helias*). Deposited by Miss Attwood.
1 Golden Agouti (*Dasyprocta agouti*). Presented by the Hon. and Rev. E. V. Bligh.
1 African Civet Cat (*Viverra civetta*). Lagos. Purchased.
1 Coati (*Nasua nasica*). Presented by Lady Lovelace.
1 Hyrax (*Hyrax capensis*). Presented by Ed. Rigby, Esq.
2 Common Chameleons (*Chamæleon vulgaris*). Bengal. Purchased.
9. 1 Two-spotted Paradoxure (*Nandinia binotata*), ♂. Presented by C. D. O'Connor, Esq.
11. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by J. Spanforth, Esq.
1 Rhesus Monkey (*Macacus erythræus*), ♂. Presented by J. Spanforth, Esq.
1 Marmoset Monkey (*Hapale jacchus*). Presented by A. H. Cocks, Esq.
1 Giraffe (*Camelopardalis giraffa*), ♀. Purchased.
14. 1 Common Redpole (*Ægiothus minor*). Purchased.
1 Brambling (*Fringilla montifringilla*). Purchased.
1 Twite (*Ægiothus montium*). Purchased.
3 Rufous Tinamous (*Rhynchotus rufescens*). Presented by Dr. Wood.
16. 2 Barred Doves (*Geopelia striata*). Presented by W. S. Britton, Esq.
17. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Deposited by J. H. Percival, Esq.

Oct. 17. 1 Common Crowned Pigeon (*Goura coronata*). Deposited by Miss Attwood.

1 Short-eared Owl (*Otus brachyotus*). Captured at sea. Presented by R. Munt, Esq.

18. 1 Garden Tree-Boa (*Corallus hortulanus*). Received in exchange.

23. 2 Brent Geese (*Bernicla brenta*), ♂ ♀. Received in exchange.

24. 1 Daubenton's Curassow (*Crax daubentoni*), ♀. Deposited by Major Mundy.

1 Cape Weaver Bird (*Euplectes capensis*). Presented by W. J. Green, Esq.

1 Grand Eclectus (*Eclectus grandis*). Purchased.

25. 1 Eland (*Oreas canna*), ♂. Deposited by Viscount Hill, F.Z.S.

1 Cape Eared Seal (*Otaria pusilla*). Presented by H.E. Sir H. Barkly, C.M.Z.S.

26. 6 Harvest-Mice (*Mus minutus*). Presented by Miss Maskelyne.

27. 1 Blue-and-Yellow Maccaw (*Ara ararauna*). Presented by J. Wright, Esq.

28. 1 Black-faced Spider Monkey (*Ateles ater*), ♀. Purchased.

1 Common Boa (*Boa constrictor*). Purchased.

2 Common Boas (*Boa constrictor*). St. Lucia. Presented by H.E. G. W. Des Vœux.

29. 1 Crested Porcupine (*Hystrix cristata*). Presented by Capt. Coxwell.

30. 1 Gaimard's Rat Kangaroo (*Bettongia gaimardi*), ♀. Born in the Menagerie.

1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by Frank Attwells, Esq.

31. 1 White-headed Woodpecker (*Leuconerpes candidus*). Received in exchange.

1 Blessbok Antelope (*Damalis albifrons*). Born in the Menagerie.

Nov. 1. 1 Coati, brown var. (*Nasua nasica*), ♀. Paraguay. Presented by Capt. Hairby.

1 Jaguar (*Felis onca*), ♂. S. America. Presented by A. de Marriette, Esq.

3 Bronze Fruit-Pigeons (*Carpophaga ænea*). Received in exchange.

1 Gentle Cat (*Felis mitis*), ♂. Presented by Arthur Nugent West, Esq.

2. 2 Red-breasted Pigeons (*Phlogœnas cruentata*). Philippine Isles. Presented by Harry J. Veitch, Esq.

3. 1 Poë Honey-eater (*Prosthemadera novæ-hollandiæ*). Presented by Capt. Alexander.

4. 2 Green Conures (*Conurus pavua*). Trinidad. Presented by A. Warrington, Esq.

6. 1 Stanleyan Chevrotain (*Tragulus stanleyanus*), ♀. Malacca. Presented by G. R. Milles, Esq.

1 Grey Ichneumon (*Herpestes griseus*). Presented by George B. Richardson, Esq.

1 Great-headed Maleo (*Megacephalon maleo*). Celebes. Presented by Capt. Parish, R.N.

1 Vieillot's Pheasant (*Euplocamus vieilloti*), ♂. Mergui. Presented by Capt. Parish, R.N.

Nov. 6. 1 Javan Peafowl (*Pavo muticus*). Mergui. Presented by Capt. Parish, R.N.
9. 2 Short-eared Owls (*Otus brachyotus*). Presented by Capt. D Herd, C.M.Z.S.
3 Red Foxes (*Canis fulvus*). Presented by Capt. D. Herd, C.M.Z.S.
1 Chinese Pucras (*Pucrasia xanthospila*), ♂. Presented by the Duke of Wellington, K.G.
1 Temminck's Tragopan (*Ceriornis temminckii*), ♂. Presented by the Duke of Wellington, K.G.
11. 1 Black-faced Spider Monkey (*Ateles ater*), ♀. Panama. Purchased.
2 Crested Agoutis (*Dasyprocta cristata*). Panama. Purchased.
1 Spotted Cavy (*Cœlogenys paca*). Panama. Purchased.
1 Nicaraguan Rattlesnake (*Crotalus horridus*). Nicaragua. Presented by Capt. J. M. Dow, F.Z.S.
2 Grey Seals (*Halichœrus grypus*), ♂ and ♀. South Wales. Purchased.
13. 1 Vervet Monkey (*Cercopithecus lalandii*), ♀. Presented by the Rev. J. C. King.
2 Earle's Weka Rails (*Ocydromus earlei*). New Zealand. Deposited.
15. 1 Weeper Capuchin Monkey (*Cebus capucinus*), ♂. Presented by W. Parfitt, Esq.
2 Bower-birds (*Ptilonorhynchus holosericeus*), ♂. Purchased.
18. 1 Gaimard's Rat-Kangaroo (*Bettongia gaimardi*), ♀. Presented by C. J. Holdsworth, Esq.
1 Tasmanian Jerboa Kangaroo (*Bettongia cuniculus*). Presented by Miss J. B. Thompson.
19. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Purchased.
20. 1 Fat Dormouse (*Myoxus glis*). Presented by Miss Fairholme.
21. 1 Upland Goose (*Chloëphaga magellanica*), ♀. Falkland Islands. Presented by Commander H. Stair Sandys.
1 Chinese Pucras (*Pucrasia xanthospila*), ♀. Purchased.
22. 1 Spotted Eared Owl (*Bubo maculosus*). Presented by A. Swanzy, Esq.
23. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Presented by Miss F. M. Cobbe.
24. 1 Australian Thicknee (*Œdicnemus grallarius*). Presented by Sydney Gilling, Esq.
28. 1 Grey Ichneumon (*Herpestes griseus*), ♂. Presented by Major H. L. Grove.
1 Yellow-footed Rock-Kangaroo (*Petrogale xanthopus*). Born in the Menagerie.
29. 1 Sœmmerring's Antelope (*Gazella sœmmerringii*). Presented by C. MacIver, jun., Esq. From Suez, Egypt.
1 Hybrid Duck, ♂. Presented by M. Joseph Cornély.

Dec. 1. 1 Persian Gazelle (*Gazella subgutturosa*), ♀. Persia. Presented by C. Czarnikow, Esq.
4. 1 Grivet Monkey (*Cercopithecus grisco-viridis*), ♂. Deposited by Mrs. H. Edwards.
1 Western Slender-billed Cockatoo (*Licmetis pastinator*). Presented by Mdme. R. A. Caplin.
2 Paradise-Grackles (*Acridotheres tristis*). Purchased.
6. 1 Hedgehog (*Erinaceus europæus*). Presented by E. Maude, Esq.

Dec. 6. 1 Black-footed Penguin (*Spheniscus demersus*). Deposited by Lord Londesborough, F.Z.S.
1 Little Grebe (*Podiceps minor*). Presented by A. M. Hill, Esq.
1 Common Night-Heron (*Nycticorax europæus*). Purchased.
9. 1 Polar Bear (*Ursus maritimus*), ♂. Nova Zembla. Presented by B. L. Smith, Esq., F.Z.S.
1 Wedge-tailed Eagle (*Aquila audax*). Presented by C. Clifton, Esq.
1 Duck-Falcon (*Falco anatum*). Presented by C. Clifton, Esq.
10. 1 Tamandua Ant-eater (*Tamandua tetradactyla*). Received in exchange.
1 Collared Fruit-Bat (*Cynonycteris collaris*), ♂. Received in exchange.
11. 1 Ogilby's Jerboa Kangaroo (*Bettongia ogilbyi*), ♂. Presented by J. F. Newton, Esq.
1 Ring-necked Parrakeet (*Palæornis torquata*). Presented by Mrs. Hall.
12. 3 Crested Ground-Parrakeets (*Calopsitta novæ-hollandiæ*). Hatched in the Gardens.
1 Wedge-tailed Eagle (*Aquila audax*). Presented by Mr. J. Pritchard.
13. 2 Illiger's Maccaws (*Ara maracana*). Purchased.
2 St. Thomas's Conures (*Conurus xantholæmus*). Purchased.
14. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Presented by G. Van Hare, Esq.
1 Cuvier's Toucan (*Ramphastos cuvieri*). Purchased.
1 Violaceous Plantain-eater (*Musophaga violacea*). Purchased.
18. 1 Common Seal (*Phoca vitulina*). Received in exchange.
19. 1 Sulphury Tyrant Bird (*Pitangus sulphuratus*). Purchased.
1 Gold Pheasant (*Thaumalea picta*). Presented by the Rev. H. G. Nind.
2 Vicunas (*Auchenia vicuna*). Presented by Charles Bath, Esq.
20. 1 Hawfinch (*Coccothraustes vulgaris*). Purchased.
1 Snow Bunting (*Plectrophanes nivalis*). Purchased.
2 Bullfinches (*Pyrrhula rubicilla*). Purchased.
1 Mountain-Linnet or Twite (*Ægiothus montium*). Purchased.
21. 1 Moustache-Monkey (*Cercopithecus cephus*). Received in exchange.
2 Vinaceous Turtledoves (*Turtur vinaceus*). Presented by J. W. Wooler, Esq.
1 Grey-winged Blackbird (*Turdus pœcilopterus*). Cashmere. Presented by Mrs. W. A. Ross.
23. 1 Blind Crayfish (*Astacus pellucidus*). Mammoth Cave of Kentucky. Presented by the Rev. H. Boyd.
1 Teguexin Lizard (*Teius teguexin*). Presented by Dr. J. A. Palin, C.M.Z.S.
1 Weasel-headed Armadillo (*Dasypus sexcinctus*). South America. Presented by Dr. J. A. Palin, C.M.Z.S.
1 Common Boa (*Boa constrictor*). South America. Presented by Dr. J. A. Palin, C.M.Z.S.
1 Common Boa (*Boa constrictor*). South America. Presented by John Beaton, Esq.
24. 2 Crested Ground-Parrakeets (*Calopsitta novæ-hollandiæ*), ♀ and ♂. Deposited by A. J. Lewis, Esq., F.Z.S.
26. 1 Kinkajou (*Cercoleptes caudivolvulus*), ♂. Presented by Henry Sturgis, Esq.

Dec. 26. 1 Hybrid Deer (between *Cervus alfredi* ♂ and *C. marianus* ♀). Born in the Menagerie.

27. 1 Prince Alfred's Deer (*Cervus alfredi*), ♀. Born in the Menagerie.

1 Arabian Baboon (*Cynocephalus hamadryas*), ♂. Presented by Capt. T. A. Hunter.

28. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by H. G. Gibbons, Esq.

1 Redshank (*Totanus calidris*). Purchased.

29. 4 Mona Monkeys (*Cercopithecus mona*), 2 ♂ and 2 ♀. Purchased.

1 Rough-legged Buzzard (*Archibuteo lagopus*). Purchased.

1 Philantomba Antelope (*Cephalophus maxwelli*), ♀. Born in the Menagerie.

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LIST OF THE PUBLICATIONS

OF THE

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THE scientific publications of the Zoological Society are of two kinds—"Proceedings," published in an octavo form, and "Transactions," in quarto.

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[April, 1872.]

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